

WO 2005/017148

PT/US2003/041600

ggtgatactctcacaatcagaagttcaaggcgaagccacactgactgtagacaaatctccagcacagcctacatgcagctcag
cagcctgacatctgaagactctcgggtctattctgtgcaagagtggtgactatagtaactcttactgactcagctgctggggcac
aggggaccacggtcaccgtctctctgtatcaatccaactctgaagaagcaaaagagagagccaaaaaggaaggaaccaaga
aatctaacacgctgcacattgttctgactcagctcagccaccctgtctgtgactccagagatagagctctcttctcagcaggcc
5 agccagagatlagcgactacttactcgggtatcaacaaaatcacatgagctccaaggcttctcaaatatgcttccatccatc
tctgggatccctccaggtcagtgaggcagtgatcagggtcagattcactctcagatcaacagtggtggaacctgaagatgttgaa
tttattactgtcaacatgggtcacagctllccgtggagcttgggtggagggcaccaagctggaatacaaacggggtgctggctcg
ggcggaggtgggtcgggtggcgggagctcagatccagttgggtgcaactggaccctgagctgaagaagcctggagagacagct
caggatctctcgaaggcttctgggtatgcttcaactactggaatgagtggtggagagatggcaggaaggggtttgaagt
10 ggtatggctggataaacacccactctggaagtgcacaaatgtagaagacttcaaggacggtttgctctcttggaaacctctgc
caacactgcataattacagataagaacctcaagatgaggacacggctacgtatttctgtgtgagactcgggaatggttaactatga
ctgctgctcttcttactctgggccaagggaactggtcactgtctctgacagggcccaaatctctgacaaaactcacacatc
ccaccgtcccagcactgaaactctgggggagctgtcagctctctcttcccccacaaacccaagacacacctcatgactcccg
gaccctgaggtcacatcgctggtgggtggagctgagccacgaagacctgagtgcaagttcaactgtacgtggagcgcgtgga
15 ggtgcataatgccaagacaaagccgctgggagggcagctacacagcacgtacgtgtgtgtagcagctcctcaccgtctgacca
ggctgctgctgaatggcgaagggtacaaaggtcgaaggtctcacaacaaagccctccagccccatcgaagaaacatctccaaagc
caaaaggcagccccgagaaaccacaggtgtacaccctgccccatcccggtatgagctgaccaagaaccaggtcagctgact
gctggtcaaaaggcttctatccacgacatcgcctggaggtgggagagcaatgggcagccggagaacaactacaagaccacg
ctcctccgtgctgactccgacggctcctctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgctct
20 tctatgctccgtgatgcatgaggtctgcacaaactacacgcagaagagcctctcctctgctccgggtaaatgatctaga

2H7-antiCD40 scFv MTH (SSS) MTH2W1CH3 (2H7-40.2.2201g) (amino acid sequence) (SEQ ID NO: __)

MDFQVQIFSFLLISASVIIARGQIVLSQSPAILASAPGEKVTMTCRASSVSVMHWY
25 QQKPGSSPKPWYAPSNLASGVPARFSGSGGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKGSGSGGGSGGGSSQAYLQSGAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFYFDVWGTGTTVTVSSDQNSSEAK
KEEAKKEEAKKSNSVDIVLTQSPATLSVTPGDRVLSLSCRASQSISDYLHWYQKSH
30 ESPRLLIKAYASHSISGIPSRFSGSGSGDFTLSINSVEPEDVGIYYCQHGHSFPWTFGG
GTKLEIKRGGGSGGGSGGGSGGSIQLVQSGPELKKPGETVRISKASGYAFTTTG
MQVWQEMPQKGLKWIGWINTPLWSAKICRRLRQGRFAFSLETSANTAYLQISNLKD

WO 2005/017148

PCT/US2003/041600

EDTATYFCVRSNGNGNYDLAYFAYWGQGLTVTVSDQEPKSSDKTHTSPSPAPPELL
GGSSVFLFPKPKDMLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK
PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPRE
PQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSD
5 GSFFLYSKLTVDKSRWQQGNVFCFSVMHEALHNHYTQKSLSLSPGK

5B9 VH (includes the VH leader peptide) (nucleotide sequence) (SEQ ID NO: __)

atggctgctctgggggctgctctctgctcgggtgacattccaagctgtgtcctatccagggtgcagctgaagcagtcaggacctggcc
tagtgcagctctcacagagcctgtccalcacctgcacagctctgtgttctcattaaactacctatgctgtacactgggttcgccagctctc
10 caggaaagggtctggagctgggtggagtgataggagtggaatcacagactataatgcagcttcatatccagactgagcatc
accaaggacgattccaagagccaagtttctttaaaatgaacagctctgcaacctaatgacacagccatttattactgtgccagaaatg
gggtgataactacccttattactatgctatggactactgggtgcaaggaaactcagtcaccgtctccca

5B9 VH (minus the leader) (nucleotide sequence) (SEQ ID NO: __)

15 cagctgacgtggaagcagtcaggacclggcctagtgcagctccacagagcctgtccaicacgtgcacagctctgtgttctcatta
actacctatgctgtacactgggttcgccagctccaggaaagggtctggagtggtctgggagtgataggagtggtggaatcacaga
ctataatgcagcttcatatccagactgagcatcaccaaggacgattccaagagccaagtttctttaaaatgaacagctctgcaaccta
atgacacagccatttattactgtgccagaaatgggggtgataactacccttattactatgctatggactactgggtgcaaggaaactca
gtcaccgtctccca

20

5B9 VH (includes leader peptide) (amino acid sequence) (SEQ ID NO: __)

MAVLGLLFLCLVTFPSCVLSQVQLKQSGPGLVQSSQSLSITCTVSGFSLTTYAVHWV
RQSPGKGLEWLGVISGGITDYNAAFISRLSITKDDSKSQVFFKMNSLQPNDAIY
YCARNGGDNPYPYYAMDYWGQGSVTVSS

25

5B9 VH (no leader peptide) (amino acid sequence) (SEQ ID NO: __)

QVQLKQSGPGLVQSSQSLSITCTVSGFSLTTYAVHWVRQSPGKGLEWLGVISGGI
TDYNAAFISRLSITKDDSKSQVFFKMNSLQPNDAIYYCARNGGDNPYPYYAMDY
WGQGSVTVSS

30

WO 2005/017148

PCT/US2003/041600

5B9 VL (nucleotide sequence) (SEQ ID NO: __)

atgagggtctctgtcagcttctggggctgtgtgctctggatccctggatccactgcagatattgtgatgacgcagggtgcattctc
caatccagtcactcttggaaatcagcttccatctcctgcagggtctagttaaggatctctacatagtaatggcatcacttaattgtattgg
taatctcgagaagccagccagctctctcagctctgatttatcagatgtccaacctggctcaggagtcaccagacaggttcagtagca
5 ggggtcaggaaactgattccacatgagaatcagcagagtggaaggctgaggatgtgggtgtttattactgtgtcctaaatctagaact
tccgtctcagcttgggtctgggaccgaagctggagctgaaacgg

5B9 VL (amino acid sequence) (SEQ ID NO: __)

MRFSAQLLGLLVLPWGSTADIVMTQAAFSNPVTLGTSASISCRSSKSLLSHNGITY
10 LYWYLQKPGQSPQLLIYQMSNLAGVDPDRFSSSGSGTDFTLRISRVEAEDVGVYYC
AQNLELPLTFGAGTKLELKR

5B9 scFv (nucleotide sequence) (SEQ ID NO: __)

aagcttggccgcatgagggtctctgtcagcttctggggctgtgtgctctggatccctggatccactgcagatattgtgatgacgca
15 ggctgcattctccaatccagtcactcttggaaatcagcttccatctcctgcagggtctagttaaggatctctacatagtaatggcatca
cttattgtattgtatctgcagaagccaggccagctctccacagctcctgatttatcagatgtccaacctggctcaggagtcaccagaca
ggttcagtagcagtggttcaggaaactgatttcacactgagaatcagcagatggagggtgagatgtgggtgtttattactgtgtc
aaaatctagaactccgctcagcttgcgtctgggaccgaagctggagctgaaacgggggtgctgggtgctcgggcgggtgtgggt
cgggtgctggcgggctcgtcacagggtcagctgaaagcagtcaggacctggcctagtgcagtcctcacagagcctgtccatcacct
20 gcacagctctctgtttctcttaactacatctgctgtacactgggttcgccagtcctcaggaaaaggctcggagtggtctggagatgat
atggaagtgtgggaatcacagactataatgcagctttcatalccagactgagcatcaccgaagcagatccaagaaccaagtttcttt
aaaatgaacagctctgcaacctaatgacacagccatttattactgtgccagaatgggggtgataactaccttattactatgctatgga
ctactggggcaaggaacctcagtcaccgtctcctct

25 5B9 scFv (amino acid sequence) (SEQ ID NO: __)

MRFSAQLLGLLVLPWGSTADIVMTQAAFSNPVTLGTSASISCRSSKSLLSHNGITY
LYWYLQKPGQSPQLLIYQMSNLAGVDPDRFSSSGSGTDFTLRISRVEAEDVGVYYC
AQNLELPLTFGAGTKLELKRGGGSGGGSGGGSSQVQLKQSGPLVQSSQSL
ITCTVSGFSLTTYAVHWVRQSPGKGLEWLVGVWSGGITDYNAAFISRLSITKDDSK
30 SQVFFKMNSLPNDTAIYYCARNGGDNPYYYAMDYWGQGTSTVTVSS

WO 2005/017148

ECT/US2003/041600

SB9 scFv-hmtfgG1-hCD80 (nucleotide sequence) (SEQ ID NO: __)

aagcttgccgccatgagggtctctgctcagcttctggggctgcttctgctctggatccctggatccactgcagatattgtgatgacga
ggctgcattctccaatcagctactcttggaacatcagcttccatctctcggagctctagaaagctctcatagatgaatggcatca
5 ctatttattggtatctcagaagccaggccagctctcctcagctcctgattatcagatgccaacctggcctcaggagctccagaca
ggticagtagcagtgaggcaggaactgatctcacactgagaatcagcagatggagggctgagagtggtggttattactgtgctc
aaaatctagaactccgctcagcttctgggaccgaagctggagctgaaacggggctgggctggcctggcggctggctggggt
cggggctggcgggagctgcacagtgagctggaagcagtcaggacctggcctagtgagctcctcagagagcctgtccatcaact
gcacagctctctggtttcattactacatctgctgacactggggttcgcaagctccaggaagggctgctgagtgctgggagtgat
10 atggagtggtgggaatcacagactataatgagcgtttcattatccagactgagcagcaccacgaagcagcttccaagagcgaagtttctt
aaaatgaacagctgccaacctgaacagcgcatttattactgtgccagaatgggggtgataactaccttattactgctatgga
ctactgggtcaaggacaacctcagtcaccgtctctctgctggaagccaaatctctgacaaaactacacagaagccaccgagcc
cagcacctgaactctctggggagctgctgcttctcttcccccaaaacccaagacacccctcatgctcccgaccacctgag
gtcacatctgctggtggtgagctgagccacgaagacctgaggtcaagttcaactgtgactgagcagggcgtgaggtgcataat
15 gccaaagacaagccggcggggagcagctacaacagcagctgacgtggtgctgagcgtctcaccgtctgaccagcagctggct
gaatggcaaggaglacaaagtcaaggtctccaacaaagccctccagcccccacatcaggaagaaacatctcgaagccaaagggc
agccccgagaaccacaggtgtacacccctgccccatccgggatgagctgaccaagaaccaggctcagcctgactgctgctga
aaggcttctatccagcagcagctcgcgtgagtgaggagagcaatgggcagccgggaacaactacaagaccacgctccgtg
ctggactccgagggctcttctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtctctctatgctc
20 cgtgatgcatgaggtctgctgcacaaccactacacgacagaaagagcctctcctctgctccgggtaagcggatcttcgaacctgctcc
catctgggcattaccttaatctcagtaaatggaattttgtgatatgctgcctgacctactgcttgcaccaagatgcagagagaga
aggaggaatgagagattgagaagggaaggtgacgcctgtataaactgatactcag

SB9 scFv-hmtfgG1-hCD80 (amino acid sequence) (SEQ ID NO: __)

25 MRFS AQL LGLLVLPWPGSTADIVMTQA AFSNPVTLGTSASISCRSSKSLLSHNGITY
LYWYLQKPGQSPQLLIYQMSNLASGV PDRFSSSGSGTDFTLRISRVEAEDVG VYYC
AQNLELP LTFGAGTKLELKRGGGSGGGSGGGSSQVQLKQSGPLVQSSQSLS
ITCTVSGFSLTTYAVHWVRQSPGKGLEWLVGIWSSGITDYNAAFISRLSITKDDSK
SQVFFKMNSLQPNDAIYYCARNGGDNPYYYAMDYWGQGTSVTVSSDLEPKSS
30 DKTHTSPSPAPELLGGSSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNW
YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPA
PIEKTIKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQP

WO 2005/017148

PGT/US2003/041600

ENNYKTTPVLSDSGSFFLYSKLTVDKSRWQQGNVFSVMEALHNHYQKSL
LSPGKADPSNLLPSWAITLISVNGIFVICCLTYCFAPRCRERRRNERLRRESVRPV

2e12 scFv WTH CH2 CH3 (2e12 scFv-WthIgG-CD80) (nucleotide sequence) (SEQ

5 ID NO:)

aaagctatggatttcaagtcgcaatttcagcttctgctaatacagtcctcagtcataatgtccagagagagtcgacattgtctcacc
aatctccagcttcttggctgtctctaggtcagagagccacatctctgcagagccagtggaagtgtgtaataatgatgcacaagtt
taatgcagtcggtaccaacagaaccagagacccacaaactctcatctctgctcatccaagtagaatactggggtccctgcc
agggttagtgagcagtcggtctgggacagactcagcctcaacatccatctctgagaggagatgataatgcaatgtatttctgcagc
10 aaagtaggaaggttcttggacgttcgggtggagcccaagctggaaatcaaacggggtggcgtgctggcgggaggtggg
tcgggtggcggcggtatcaggtgcagctgaaggagtcagacctggcctggtggcgcctcacagagcctgtccatcacatgc
accgtctcagggttctcaataaccggctatgtgttaactgggttcgccgcctccaggaaagggtctgagtggtctgggaatgat
atgggggtgatggaagcacagactataatcagctctcaaatccagactgagcatcaccaaggacaactccaaggagccaagtcttct
aaaaatgaacagctgcgaactgatgacacagccagataactgtgccagagatggttatagtaacttcatatctgttatggact
15 actgggtcgaaggaaacctcagtcaccgtctctcagatctggagcccaaaactgtgacaaactcacatgcaccaccgtgccca
gcacgtgaactctggggggaccgtcagctctctctcccccacaaacccaaggacacccctcagatctccggagccctgaggt
cacatgctgtggtggtggagctgagccacgaagacctgaggtcaagtcaactggtacgtggagcggcgtgaggtgctataatgc
caagacaaagccggggagggagcagtacaacagcacgtaccgtgtgtcagcgtctcaccgtcctgcaccaggaactgggtga
atggcaaggaggtacaagtgcagggtctccaacaaagccctccagcccccacgcagaaaaacatctccaaggccaagggcag
20 cccgagaaaccagaggtgtacacctgcccccacccgggatgagctgaccagaaccaggtcagcctgacctgctctgggtcaaa
ggctcttatccagcgaatcagcgtggtgagtgagagcaatggcgagccggagaaacactacaagaccacgcctccctgtgt
ggactccgagcgtctctctctctacagcaagctcaccgtgacaaagacaggtggcagcagggggaactcttctcatgtctc
gtgatgcatgagcgtctgcacaacactacacgcagaagacgtctcctgtctccgggtaangcggaactcttctgaacctgtccc
atcctggggcattacattatctcagtaaatggaatttctgtatagctgcctgacctactgcttgcgcccaagatgcagagagagaa
25 ggaggaatgagagattgagaagggaaggtgacgccctgtataatcgat

2e12 scFv WTH CH2 CH3 (2e12 scFv-WthIgG-CD80) (amino acid sequence) (SEQ

ID NO:)

MDFQVQIFSLLISASVIMSRGVDIVLTQSPASLAVSLGQRATISCRASESVEYYVTS
30 LMQWYQKPGQPPKLLISAASNVESGVPARFSGSGSTDFSLNIHPVEEDDIAMFY
CQQSRKVPWTFGGGKLEIKRGGGGSGGGSGGGGSGVQLKESGPGVLVAPSQSL
ITCTVSGFSLTGYGVNWWVRQPPGKLEWLGMTWGDGSTDYNSALKSRLSITKDNS

WO 2005/017148

PCT/US2003/041600

KSQVFLKMNSLQTTDARYYCARDGYSNFHYVMDYWGQGSVTVSSDLEPKS
CDKTHTCPPCPAPELLGGPSVFLPPPKPKDTLMISRTEVTCVVVDVSHEDPEVKFN
WYVDGVEVHNAKTKPREBQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALP
APIEKTISKAKGQPREPVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQ
5 PENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNYHTQKSL
SLSPGKADPSNLLPSWAITLISVNGIFVICCLTYCFAPRCRERRRNERLRRESVRPV

2H7-human IgE Fc (CH2-CH3-CH4) (nucleotide sequence) (SEQ ID NO: __)

aagcttgcgcgcatttcaagtcgagatttcagcttctctgaatcagtgcttcagtcataattgccagaggacaaattgtctct
10 cccagctccagcaatctctgtctcagtcaggggagaaagtcacaaactgcttcagggccagctcaagtgtaagtacatgcact
ggtaaccagcagaagccaggaatctcccccacccctggattatgcccatcacaactggctctcggagtcctctgctcgttcagtg
cgactgggtctgggacccttactctctcacaacagcagagtgagggtgaagatgctgcacattactgcccagcagtggaattt
taaccacccacgttcgtctgggaccacagctggagctgaaaggtggcgtgctcggcggtggtggtgagctcggagagggtg
ggagctccagggctatcacagcagctcggggtgagctggtgagggcctgggctcagtgaaagatgctcctcaaggctctgctg
15 tacacatttacagttacaatatgcaactgggttaaagcagacacctagacaggcctggaatggagtggagctattatccaggaaat
gggtgatactctcacaatcagaagttcaaggcgaaggccacactgactgtagcaaatcctccagcacagcctacatgcagctcag
cagcctgacactgaagactctgcgtctatttctgtgcaagagtggtgtactatagtaacitctactggtactcgtatgtctggggcac
agggaccacgggtaccgtctctgaltacgtctgtccagggaactcaccggccacagtggaagattctacagctgctctgcgacg
gcgccgggacacttccccgaccatccagctcctgtgctcgtctctgggtacacccagggaactatcaacactcactggctgga
20 ggacgggcaaggtcatggagctggaactgtccaccgctctaccacgcaggagggtgagtgcgctccacacaaagcgagctca
ccctcagccagaagcactggctgtcagaccgacactacacctgccaggtcactatcaaggtcacacottgagacagaccacaa
gaagtggtcagattccaaccggagaggggtgagcgctacctaaggccggccagccggttcgactgttcatccgaagtccgc
cacgatacactgtctgggtgagactggcaccagcaaggggaccgtgaacctgacctgtccggcgacagtggaagcctgt
gaaccactccacagaaaggagagaaagcagcgaatggcaggttaaccgtacgtccacccctgccgggtgggcaccgcagact
25 ggaicagaggggagagactaccagtcagggtgaccacccccacctgccagggccctatgctgtccagacacaaagaccag
cgcccgccgtgctgccccggaagtctatgctttgcgacgcggagtgccggggagccggggagacaaagcgcacctcgcctgc
ctgatccagaactcatgctcaggacatctcgggtcagtggtgcacaaagaggtgcagctcccggagcggccgacagcagc
acgacgccccgcaagaccagggtccggctctctcgtctcagccgctggaggtgaccaggccgaalggggcagcaagaaga
tgagtatctgcgtcagctccatgagcgagcagccctcacagaccgtccagcgagcgtgtctgtaaatccggtaantgat
30 aatcaga

WO 2005/017148

PCT/US2003/041600

2H7 scFv IgE (CH2-CH3-CH4) (amino acid sequence) (SEQ ID NO: __)

MDFQVQIFSLFLISAVIIARGQIVLSQSPAILSASPGBKVTMTCRASSSVSYMHWY
QKQPGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKGSGSGSGSGSGSGSQAYLQSGAELVRPGASVKMSCK
5 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPGNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDASVYFCARVYYNSYWFYDVGWGTGTVTVSDHVCSDRFTF
PIVKILQSSCDGGGHPPTIQLLCLVSGYTPGTINITWLEDGQVMDVDLSTASTQE
GELASTQSELTLQKHWSLDRYTCQVTYQGHTFEDSTKKCADSNPRGVSAYLSR
PSPFDLIRKSPITITCLVVDLAPSKGTVNLWTSRASGKPVNHSTRKEEKQRNGTLTV
10 TSTLPVGTDRWDIEGETYQCRVTHPLPRALMRSTTKTSGPRAAPEVYAFATPEWP
GSRDKRTLACLQNFMPEISVQWLIINEVQLPDARHSTTQPRKTKGSGFFVFSRLE
VTRAEWEQKDEFICRAVHEAASPSQTVQRAVSVNPGK

2H7 scFv MH (SSS) MCH2WTCH3 (nucleotide sequence) (SEQ ID NO: __)

15 aagcttgcegcgcatgatttcaagtcgagatttcagcttctgctaactcagtgcttcagtcataahtgcagaggacaattgtctct
cccagctctccagcaatctctgtctgcatctccaggaggagaagctcaaatgacttcagggccagctcaagtgtaagttacatgcact
ggtaccagcagaagccagatctctccccaaacctggatttatgcccatccaaacctgctctggagctccctgtctgcttcagtg
gcagtggctgtggaccctcttactctctcacaatcagcagagtgaggctgaagatgctgccattattactccagcagtggaagtt
taaccaccaccagcttcgtgctggaccgaagctggagctgaagatgctggctgctggcggctgctggatctggaggagagtg
20 ggagctctcaggtctatctacagcagctctgggctgagctggtagggcctgggctcagtggaagatgctctcgaagcttctggc
tacacatttaccagttacaatatgcactgggtaaagcagacacctagacaggcctggaatgattggagctattatccagaagaa
ggtgatactctcacaatcagaagttcaaggcgaagccacactgactgtagacaaatctccagcacagctcatatgcagctcag
cagcctgacatctgaagactctcgtctcttctgtcgaagagtggtgtactatagtaactcttactggtactctgatgtctgggcac
aggggaccacggtcaccgtctctctgatcaggagcccaatctctgacaaaactcacacatccccaccgtccccgacacctgaac
25 tctgggggatgtgcagctctctctctcccccaaaacccaaggacacctcatgatctccggacccctgaggtcacatgcgtg
gtgtgtgacgtgagccacgaagaccttgagggtcaagttcaactgtgtacgtggagcgtgctggaggtgataatgccaaagacaag
ccgctggggagagcagctacacagcagctaccgtgtgtcagcgtctctaccgtctgacacaggactggtgaaatggcaagga
gtacaagtcgaaggtctccaacaagccctccagccccatcgagaaaacaatctccaagccaaaggcagccccgagAAC
cacaggtgtacacctgtccccatccggatgagctgaccaagaaccaggtcagcctgactgctgtgtcaaggctctatcc
30 cagcgacatcgctgtgagtgaggagagcaatggcagccggagacaactacaagaccacgctccgtgtgtgactccgac
ggctctctctctctacagcaagctcaccgtggacaagagcaggtggcagcagggaacgtctctcatgtccgtgtgagcatga
ggctctgcacaaacctacacgcagaagagcctctctgtctccggtaaatgatctaga

WO 2005/017148

PT/US2003/041600

2H7 scFv MH (SSS) MCH2WTCH3 (amino acid sequence) (SEQ ID NO: __)

MDFQVQIFSLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
 QQKPGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
 5 FNPPTFGAGTKLELKDGGGSGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
 ASGYFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
 TAYMQLSSLTSEDSA VYFCARVYYYSNSYWFYFDVWGTGTTTVSSDQEPKSSDK
 THTSPSPAPELLGGSSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV
 DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYCKVSNKALPAPIE
 10 KTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
 NYKTTTPPLDSDGSFFLYSKLTVDKSRWQQGNVFCFSVMHEALHNHYTQKSLSLS
 PGK

5B9 scFv MTHWTCH2CH3 (nucleotide sequence) (SEQ ID NO: __)

15 aagcttgcgccatgagggttctctgctcagcttctgggctgcttgctcctggatccctggatccactgcagatattgtgagacgca
 ggctgcatctccaatccagtcactcttgaacatcagcttccatctcctgcaggctctagtgaagctcctcatagtaaatggcatca
 ctatttattgttgaftactgcagaagccaggccagctcctcagctcctgattatcagatgtccaaccttgccctcaggagtcaccagaca
 ggctcagtagcagtggtgcaggaaactgatttcacactgagaatcagcagagtgaggctgaggaatgtgggtgtttattactgtgctc
 aaatctagaactctcgctcagcttgcgtgctgggaccaagctggagctgaaacgggtggcggtgctcggcggtgtgtgggt
 20 cgggtggcgccgcatgclacaggtgcagctgaagcagtcaggacctgcctagtgagctctcacagagcctgtccatcaact
 gcacagctctctgtttctcattactaactatgctgtacactgggttcgccagctccaggaagggtctgagtggtgggagtgat
 atggagtggtggaatcacagactataatgcagcttccatccagactgagcatcaccaaggacgattccaagagccaagtgtttctt
 aaaatgaacagctctgcaacctaatgacacagccatttattactgtgccagaatgggggtgataaactaccttattactatgctatgga
 ctactggggtcaaggaaactcagtcaccgtctcctctgatcaggagcccaatctctgacaaaactcacatccccaccgtccccc
 25 agcacctgaaactcctggggggaccgtcagcttctcttcccccaaaacccaaggacacctcatgatctccggagccctgag
 gtcacatcgctgtgtgtggtgacgtgacccacgaagacctgaggtcaagttcaactgtacgtggagggcgtggaggtgcataat
 gccaaagcaaaagccggggagagcagctacaacagcagctaccgtgtgtgcagcgtcctcaccgtctgcaccaggagctggt
 gaalggcaaggagtagaagtgcaagggtctccaacaaagccctccagcccccacaggaanaacatccaaagccaaagggc
 agccccgagaaccacaggtgtacacctgccccatccgggatgagctgaccaagaaccaggtgacgtgacctgctgtgtca
 30 aagcttctatcccagacatcgcctggagtgggagagcaatgggcagccggagaaacactacaagaccacgctccctgtg
 ctggactccagggctcctctctctctacagcaagctaccgtggacaagagcaggtggcagcaggggaacgtcttctcatgctc
 cgtgagcatgaggtctgcacaaccactacagcagaagacctctcctgtctccgggtaaatgactaga

WO 2005/017148

ECT/US2003/041600

5B9 scFv MTHWTC2CH3 (amino acid sequence) (SEQ ID NO: __)

MRFSAQLLGLLVLPWGSTADIVMTQAAFSNPVTLGTSASISCRSSKSLHSNGITY
LYWYLQKPGQSPQLLIYQMSNLASGVDPDRFSSSGSGTDFTLRISRVEAEDVGVVYYC
5 AQNLELPLTFGAGTKLELKRGGGSGGGSGGGSSQVQLKQSGPGLVQSSQSL
ITCTVSGFSLTTYAVHWVRQSPGKGLEWLGVIWVSGGTDYNAAFISRLSITKDDSK
SQVFFKMNSLQPNDAIYYCARNGDNYPYVYAMDYWGQGTSTVTVSSDQEPKSS
DKTHTSPSPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNW
YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYCKCKVSNKALPA
10 PIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQP
ENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCFVMSHHEALHNHYTQKSLS
LSPGK

Human IgG1 hinge mutations

2H7 scFv- MTH (CSS) WTC2CH3 (nucleotide sequence) (SEQ ID NO: __)

15 aagcttgccgccatggatttcaagtcgagatttcagcttcctgctaatacagtgcttcagtcataaagccagaggacaattgtctct
cccagctctcagcaatcctgtctgcatctccaggaggagaagtcacaaatgacttcagggccagctcaagtgtaatgtacatgact
ggtaccagcagaagccagatcctccccaacccctggatttatgcccatccaacccctgctctgagtgctcctgctcgttcagtg
gcagtggtgcttggaaccttactctctcacaatcagcagaagtgagagctgaagatgctgccatttactgccagcagtgaggtt
20 taaccacccacgttcgtgctgagaccagctgagctgaaagatggcggtgctcggcggtgctgagctgagaggagtg
ggagctctcaggttactacagcagctctgggctgagctggtgagggcctgggctcagtgagatgctcgaagctctctggc
tacacattaccagttacaatgactcgggtaagcagacacctagacagggcctggaatggatggagctattatcaggaat
ggtgatactctacaatcagaagttcaaggcgaaggccacactgactgtagacaaatctccagcagcctacatgcagctcag
cagcctgacatctgaagactctgcgcttattctgtgcaagagtggtgtactatagtaactcttactggtactctgctgctgggcac
25 agggaccacgttcacgtctctctgatcagagcccaaatctgtgacaaaactcacacatcccaccgtccccagacctgaac
tctctggggggaccgtcagcttctctctcccccaaaacccaaggacaccctcatgatctccgggacctgaggtcacatcgctg
gtggtggagcgtgagccacgaagacctgaggtcaagttcaactggtagcggacggcgtggaggtgcatatgccaagacaaag
ccgcggggaggagcagtacaacagcagctaccgtgtgtgacgctcctaccgtctgcaccaggactgctgaatggcaagga
gtacaagtgcaaggtctccaacaagccctccagcccccacagagaaaactctcaagccaaaggcgagccccgagaac
30 cacaaggtgtacacctgccccatccgggatgagctgaccaagaaccagtgacgctgacctgctgtgcaaggctctatcc
cagcgacatcgcgctggagtgagagcaatgggcagccggagagaacactacaagaccacgctcccgctgctgactccgac

WO 2005/017148

PCT/US2003/041600

ggctctctcttctctacagcaagctcaccgtggacaagagcagggtggcagcaggggaacgtcttctcatgctccgtgatgcalga
ggctctgcacaaacctacacgcagaagagcctctcctgtctccgggtaaatgatctaga

2H7 scFv- MTH (CSS) WTCH2CH3 (amino acid sequence) (SEQ ID NO: __)

5 MDVQVQIFSLILISASVIIARGQIVLSQSPAILASPGKEVTMTCCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGGTSYSLTISRVEAEDAATYYCQQWS
FNPTFGAGTKLELKDGGGSGGGGSGGGGSSQAYLQQSGAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDASVYFCARVVYYNSNYWYFDVWGTGTTVTVTSSDQEPKSCDK
10 THTSPSPAPPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV
DGVEVENAKTKPREQYNSTYRVVSVLTVLHQDWLNGKEYCKCKVSNKALPAPIE
KTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVSCFSVMHEALHNHYTQKSLSLS
PGK

15

2H7 scFv- MTH (SCS) WTCH2CH3 (nucleotide sequence) (SEQ ID NO: __)

aagcctgccgccatggatttcaagtcagatttcagcttctgctaatacagtgcttcagtcataaattgccagaggacaantgtctct
cccagctctcagaatcctgtctgcatctccaggggagaaagtcacaatgacttcagggccagctcaagtgtaagttacatgcact
ggfaccagcagaagccagatctccccaaacctggatttatgcccatccaacctgctcttgagctcctgtctcgttcagtg
20 gcagtggtgtctggacctcttactcttcacaatcagcagagtgaggctgaagatgctgcaccttattactccagcagtgaggatti
taaccarccacgttcggtctgtggaccacagctggagctgaagatggcgtgtgctcggcggttggtggaatctggaggaggtg
ggagctctcaggttatctacagcagctctggggctgagctgtgaggcctggggcctcagtggaagatgtctcgaaggcttcggc
tacacatttacagttacaatatgcactgggtaaagcagacacctagacaggcctggaatggattgagctattatccaggaat
ggfatactcttacaatcagaagttcaaggcgaaggccacctgactgtagacaaatctccagcagacctacatgcagctcag
25 cagcctgacatctgaagactctgcggtcttactgtgcaagagtggtgtaclalagtaacttactgtgtaacttgatgtctggggcac
aggggaccacggfaccgtctctctgtatcaggagcccaaatctctgacaaaatcacacatgccaccgtccccagcactgaac
tctgtgggggaccgtcagctctctctctccccaaaacccaaggacacctctatgatctccggaccctgagggtcacatgcgtg
gtgtgggacgtgagccacgaagacctgaggtcaagtcaactgtgacgtggagccgtgaggtgacataatgccaaagcaaa
ccgcgggaggagcaggtacaacagcagctaccgtgtgtgacagcgtctcaccgtctgaccaggagctggctgaatggcaaggga
30 gtacaaggtcaaggctccacaagaagccctccagccccatcagagaaaacatctcagaagccaagggcagccccgagaac
cacagggtgacacctgccccatccgggatgagctgaccaagaaccagggtgacctgacctgctgtgacaaaggctctatcc

WO 2005/017148

PCT/US2003/041600

cagcgacatcggcgtggagtgagagcaafggcgagccggagacaactacaagaccacgcctccgctgctggactccgac
ggctcctctctctctacagcaagctcaccgtggacaagagcaggtggcagcagggggaacgtctctcatgctccgtgatgatga
ggctctgcacaaccactacacgcagaagagcctctccctgtctccgggtaaatgatctaga

- 5 **2H7 scFv- MTH (SCS) WTCH2CH3 (amino acid sequence) (SEQ ID NO: __)**
MDFQVQIFSLFLISASVIIARGQIVLSQSPAILSASPGKEVMTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKDGGGSGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
10 TAYMQLSSLTSEDSAVYFCARVYYNSYWYFDVWGTGTTVTVSSDQPEKSSDK
THTCPPAPPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLSL
15 SPGK

2H7 scFv- MTH (SSC) WTCH2CH3 (nucleotide sequence) (SEQ ID NO: __)

- aagcttccgccatggaatttcaagtcgaatttcaagcttctgctaatcagtgcttcagtcataaagccagaaggacaattgtctct
cccagctctccagcaatctgtctgcatctccaggaggaggaaggtcaccaatgacttcaggggccagctcaagtgtaagttacatgcact
20 ggtaccagcagaaggccagatctcccccaaacctggaattatgccccatccaaactggcttctggagtcctgctgcttcagtg
gcagtggtgctggacccttactctctcacaatcagcagaagtggaagctgaagatgctgccacttactgccagcagtggaattt
taaccaccacagcttcgtgctgggaccaagctggagctgaaagatggcggctgctcggcggtggtggtatctggaggaggtg
ggagctcagcgttactacagcagctcgggctgagctggtgagccctggggccctcagtggaagatgtctcgaaggtcttggc
tacacattaccagttacaatagcactgggtaaaagcacacacctagacaggcctggaatggattggagctattatccaggaat
25 ggtgatactctacatacagaagttcaaggcgaaggccacactgactgtagacaatactccagcacagcctacatgcagctcag
cagcctgacatctgaagactctgcggtctatttctgtgcaagagtggtgtactatagtaactcttactggtacttcgatgctgggacac
aggggaccacggtaacctctctctgatcaggagcccaaatctctgacaaaactcacacatccccaccgtgccagcactgaac
tcttgggggaccgtcagcttctctcttcccccaaaacccaaggacacctcatgactccccggaccctgaggtcacatgcgtg
gtgtgtgacgtgagccacgaagacctgaggtcaagttcaactggtacgtggagcgcgtggaggtgcataatgccaaagaaa
30 ccggggagggagcagtaaacacagcagctaccgtgtgtgacgcgtctccacgcgtccaccaggactggtgaatggcaaggga
gtacaagtgcgaagctccacaacaaagcctccagcccccctcagaaaacaatctccaaagccaaaggcgagcccgagac

WO 2005/017148

PCT/US2003/041600

cacagggtgtacacctgcccccacccgggagtgagctgaccaagaaccagggtcagcctgacctgcctggtcaaggccttatcc
cagcgacatcgccgtggagtgaggagcaatgggcagccggagagaacaactacaagaccacgcctccgctgctggactccgac
ggctcctctctctacagcaagctcaccgtggacaagagcagggtggcagcagggaacgctctctcatgctccggtgatgcatga
ggctctgcacaaccactacacgcagaagacccctctccctgctccgggtaaatgatctaga

5

2H7 seFv- MTH (SSC) WTCH2CH3 (amino acid sequence) (SEQ ID NO: __)

MDFQVQIFSLLISASVIIARGQIVLSQSPAILSPGKVTMTCRASSVSVMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKDGGGSGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
10 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFYFDVWGTTVTVSSDQEPKSSDK
THTSPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVYVDVSHEDPEVKFNWY
VDGVEVHNAAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQP
15 NNYKTTTPVLDSGDFLYSKLTVDKSRWQQGNVSCSVMHEALHNHYTQKSLSL
SPGK

HlgGMHcys1 (nucleotide sequence) (SEQ ID NO: __)

gtt gtt gat cag gag ccc aaa tct tct gac aaa act cac aca tg

20

HlgGMHcys2 (nucleotide sequence) (SEQ ID NO: __)

gtt gtt gat cag gag ccc aaa tct tgt gac aaa act cac aca tct cca cgg tgc

HlgGMHcys3 (nucleotide sequence) (SEQ ID NO: __)

25 gtt gtt gat cag gag ccc aaa tct tgt gac aaa act cac aca tgt cca cgg tcc cca gca cct

HuIgG1 MTCH3Y405 (nucleotide sequence) (SEQ ID NO: __)

gggcagccccgagaaccacagggtgtacacctgcccccacccgggaggagatgaccaagaaccagggtcagcctgacctgcct
ggtcaaggcctctatccagcgacatcgccgtggagtgaggagcaatgggcagccggagagaacaactacaagaccacgcctc

WO 2005/017148

PCT/US2003/041600

ccggtgctgactccgacggctcctctacctctatagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtcttctc
atgctccgtgatgatgaggtctctgcacaaccactacacgcagaagagcctctccctgtccccgggtaaatga

HuIgG1 MTCH3Y405 (amino acid sequence) (SEQ ID NO: __)

- 5 GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPP
VLDSDDGSFYLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

HuIgG1 MTCH3A405 (nucleotide sequence) (SEQ ID NO: __)

- gggcagccccgagaaccacaggtgtacacctgccccatccccgggagagatgaccaagaaccaggctcagcctgacctgcct
10 ggtcaaaaggctctatccacgcgacatcgccgtggagtgggagagaatgggcagccggagaacaactacaagaccacgctc
ccgtgctggactccgacggctcctctccctctatagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtcttctc
atgctccgtgatgatgaggtctctgcacaaccactacacgcagaagagcctctccctgtccccgggtaaatga

HuIgG1 MTCH3A405 (amino acid sequence) (SEQ ID NO: __)

- 15 GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPP
VLDSDDGSFALYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

HuIgG1 MTCH3A407 (nucleotide sequence) (SEQ ID NO: __)

- Gggcagccccgagaaccacaggtgtacacctgccccatccccgggagagatgaccaagaaccaggctcagcctgacctgcc
20 tggcaaaaggctctatccacgcgacatcgccgtggagtgggagagaatgggcagccggagaacaactacaagaccacgctc
ccgtgctgactccgacggctcctcttctctccgacgaagctcaccgtggacaagagcagtggtgcagcaggggaacgtcttctc
catgctccgtgatgatgaggtctctgcacaaccactacacgcagaagagcctctccctgtccccgggtaaatga

HuIgG1 MTCH3A407 (amino acid sequence) (SEQ ID NO: __)

- 25 GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPP
VLDSDDGSFFLASKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

HuIgG1 MTCH3Y405A407 (nucleotide sequence) (SEQ ID NO: __)

WO 2005/017148

PCT/US2003/041600

gggcagccccgagaaccacaggtgtacacctgccccatccccggaggagatgaccaagaaccaggtcagcctgacctgctt
ggtcaaggcttctatcccagcgacatcgccgtggagtgaggagagcaatgggagccggagaaactacaagaccacgcctc
ccgtgctgactccgacggctccttctacctgccagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtctctc
atgctccgtgatgatgaggtctgcacaaccactacacgcagaagagcctctcctgtccccgggtaaatga

5

HuIgG1 MTCH3Y405A407 (amino acid sequence) (SEQ ID NO: __)

GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPP
VLDSGDGFYLASKLTVDKSRWQQGNVFCSCVMIEALHNIHYTKSLSLSPGK

10 **HuIgG1 MTCH3A405A407 (nucleotide sequence) (SEQ ID NO: __)**

gggcagccccgagaaccacaggtgtacacctgccccatccccggaggagatgaccaagaaccaggtcagcctgacctgctt
ggtcaaggcttctatcccagcgacatcgccgtggagtgaggagagcaatgggagccggagaaactacaagaccacgcctc
ccgtgctgactccgacggctccttgcctcgccagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtctctc
catgtccgtgatgatgaggtctgcacaaccactacacgcagaagagcctctcctgtccccgggtaaatga

15

HuIgG1 MTCH3A405A407 (amino acid sequence) (SEQ ID NO: __)

GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPP
VLDSGDGFALASKLTVDKSRWQQGNVFCSCVMIEALHNIHYTKSLSLSPGK

20 **2H7 scFv MTH (SSS) WTCH2MTCH3Y405 (nucleotide sequence) (SEQ ID NO: __)**

aagcttgcccgatggatttcaagtcagatgtttagcttctctaatcagtgcttcatgataattgacagagcaaatgttctt
cccatgctccagcaatcctgctgcatctccaggggagaaaggticacaatgacttgcaggccagctcaagtgttaattacatgcact
ggtaccagcagaagccagatctcccccaaacctggattatgcccatccaacctggcttctgagtgcttccctgctcgttcagtg
gcagtggtgcttggacccttactctctcacaatcagcagagtggaaggctgaagatgctgccattatctccagcagtggaagtt
taaccacccaccgttcgtgctgggaccaaagctggagctgaaagatggcgggtgctcggcggtggtggtatcggaggaggtg

25

ggagcttcaggttatctacagcagctgtgggctgagctgtgagcctggggcctcagtggaagatgctcctcaaggcttctggc
tacacattaccagttacaatatgcactgggtaaacgagacacctgacagggcctggaatggattggagctattatccaggaaat
ggtgatacttctacaatcagaagttcaagggcaaggccacactgactgtagacaatatctccagcagagcctacatgcagctcag
cagcctgacatctgaagactctgcgtctattctgtgcaagagtggtgtactatagtaactcttacttggtacttcgatgtctggggcac
30 agggaccaccggtaccgtctctctgatcaggagcccaaatctctgacaaaactcacacatccccaccgtccccagcacctgaac

WO 2005/017148

PCT/US2003/041600

tctctgggggagcgtcagcttctcttccccccaaaacccaagacacctcatgatctcccgacccttgaggtcacatgcgtg
gtgtgtggacgtgagccacgaagacctgaggtcaagttcaactgtacgtggacgctgtgaggtgcataatgccaaagacaaag
ccggcgaggagcagtagtaacaacacgactaccgtgtgtgtcagctctcaccgtctgcaccaggactggctgaalggcaagga
gtacaaggtgcaaggtctccaacaagccctccagccccatcgagaaaacaatctcaaaagccaagggcagccccgagaac
5 cacaggtgtacaccccgccccatccgggaggagatgaccaagaacaggtcagcctgacctgctgctcaaggtctctatcc
cagcgacatcgccgtggaggtggagagcaatggggcagccggagaacaclacaagaccacgctccgtgctgactccgac
ggctctcttclactatagcaagclaccgtggacaagagcaggtggcagcaggggaacgtcttctcatgctccgtgatgcatga
ggctctgcacaaccaactacacgcagagaagcctctcctgtccccgggtaalgatctaga

- 10 **2H7 scFv MTH (SSS) WTCH2MTCH3Y405 (amino acid sequence) (SEQ ID NO: __)**
MDFQVQIFSLFLISASVIIARGQIVLSQSPAILASAPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWIIAPSNLASGVPARFSGSGSGTSTSYLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKDGGGSGGGSGGGSSQAYLQQSQAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
15 TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFYFDVWGTGTTVTVSSDQEPKSSDK
THTSPSPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV
DGVEVHNATKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKKTTPPVLDSDGSFYLISKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLSLS
20 PGK

- 2H7 scFv MTH (SSS) WTCH2MTCH3A405 (nucleotide sequence) (SEQ ID NO: __)**
aagcttgccgccatggattitcaagtgcaatttcagctctgctaatcagtgcttcagtcataatgccagaggacaaatgttctct
cccagctccagcaatcctgtctgcatctccaggggagaaaggtcacaaatgactgcaaggccagctcaaggtgaatgtacatgcaat
25 ggtaccagcagaaggccaggaatctcccccaaacctggatttatgcccatccaacctggcttcaggatccctgctcgttcagtg
gcagtggtgctgggacccttactctctcacaaatcagcagagtgaggagctgaagatgctgcccatttactgccagcagtgagggtt
taaccacccacgcttcggtgctgggaccaagctggagctgaagatggcggctggcctggcgctggagctggaggagggtg
ggagctctcagcgttatcagcagctctgggctgagctgggtgagcctggggcctcagtggaagatgctcgaaggctctggc
tacacattaccagttacaatagcactgggttaaagcagacacctagacaggcctgggaatggatggagctattatccaggaat
30 ggtgtagctctccatacatcagaagttcaaggcgaaggccacctgactgtagacaaatctccagcacagcctacatgcagctcag
cagcgtcagatctgaagactctgcgtctattctgtgcaagagtggtgtactatagtaactcttactggtacttcgatgtctggggcac

WO 2005/017148

PCT/US2003/041600

aggaccacggcaccgtctctctgacaggagcccaatctctgacaaaactcacacatccccaccgtccccagacctgaac
tcttggggggaccgtcagcttctcttccccaaaacccaaggacacctcatgatctccggacccttgagtgcatcatgctg
gtggtggagctgagccacgaagacctgaggtcaagtcaactgggtacgtggacggcgtggaggtgcataalgccaaagacaag
ccggcgagagagcagctacaacagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaaggga
5 gtaacaagtgcagggtctccaacaaagccctccagccccatcagagaaaacaatctccaagccaaaggcgagcccgagagaac
cacagggtgacacctgtccccatccggagaggatgaccaagaaccaggtcagcctgacctgcctggtaagggtcttctatcc
cagcgacatcgccgtggagtgaggagcaatggcgagccggagaaactacaagaccagcctcccgctggtgacatccgac
ggctccttcgccctctatagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtcttctcatgctccgtgatgatga
ggctctgcacaaccactacacgcagaagagcctctcctgtccccgggtaaatga

10

2H7 scFv MTH (SSS) WTCH2MTCH3A405 (nucleotide sequence) (SEQ ID NO: __)

mdfqvqifslisasviiaqgqvlsqspailsaspgkvmttcrassvsymhwyqqkpgsspkpwiyapnsilasgvparf
sgsgsgtsysltisrveadaatyycqqwsfnptfgagtklelkdgsgsgsgsgsgssqaylqqsgaelvrpgasvkmnc
kasgtytfsynmhvwktpqrqglewigaiypngdtsynqkfkgaatlvdksstaymqsltsedsavfcarvvyvsn
15 sywyfdvwtggtvttvssdqepkssdkthtspspapellggpsvflfpkpkdltmisrpevticvvvdshdedpevkfnw
yvdgvevhnaktipreeqymstyrvsvltvlhqdwlngkeykckvsnkalpapiektiskakgqprepvyylppsremt
knqvslctlvkgfypsdiawewesngqpennyktpvldsdgsfalysklitvdksrwqqgnvfscsvmhcalhnhytqksl
slspgk

20 **2H7 scFv MTH (SSS) WTCH2MTCH3A407 (nucleotide sequence) (SEQ ID NO: __)**

aagcttgccgccatgatttcaagtgcagattttcagcttctgctaatacagtgcttcagtcataatlgccagaggacaaattgttctt
cccagctccagcaatcctgtctcatctccaggggagaggtcacaatgacttgcaaggccagctcaagtgtaagtacatgcact
ggtaccagcagaaggccagatcctccccaaacctggatttatgcccaaccaacctggcttcggaggtccctctcgtcgttcagtg
gcaatgggtctgggaccttctctctcacaatcagcagatggaggtgaaagatgctgccacttatcctgccagcagtggaattt
25 taaccacccacagttcggtgctgggaccaagctggagctgaaagatggcgtgctgctcggcggtggtggtatctggaggaggtg
ggagctctcaggccttatcagcagctcgggctgagctggtgagggcctggggcctcagtgaaagatgctcgaaggcttctggc
tacacattaccagttacataatgactgggtaaaagacacacctagacaggcctggaatggaatggagctatttatccaggaaat
ggtgatacttctcacaatcaagaattcaaggcgaaggccacactgactgtagacaatctccagcagacctacatgacgtcag
cagcctgacatctgaagactctcggctctatttctgtgcaagagtggtgtactatagtaacttcttggtactcagatgctggggcac
30 agggaccacggcaccgtctctctgatcaggagcccaactctctgacaaaactcacacatccccaccgtccccagacctgaac
tcttggggggaccgtcagcttctcttccccaaaacccaaggacacctcatgatctccggagccctgaggtcacatgctgt

WO 2005/017148

PCT/US2003/041600

gtgggtggacgtgagccacgaagacctgaggtcaagttcaactgtgacgtggacggcgtggaggtgcataaagccaagacaaaag
ccgcggggagggagcagtaacaacgacgtaccgtgtgtgacgcgtctcaccgtctcaccaggaactggctgaatggcaaggga
gtacaaagtgcaggctctccaaaagccctccagcccccacgagaaaacaatctccaaaggccaaggcgagcccccagaaac
cacaggtgtacacccctgccccatccggaggagatgaccaagaaccagggtcagccctgacctgacctggtcaaaaggcttctatcc
5 cagcgacatcgccgtggagtgaggagcaatggcgagccggagaaacaclacaagaccagcctccctggtgctggactccgac
ggctctctctctcgcagcaagctcaccgtggacnaagcgaggtggcagcggggaacgtctctcatgctcgtgatgcatga
ggctctgcacacacclacacgcagaagacctctccctgccccgggtaaaatga

2H7 scFv MTH (SSS) WTCH2MTCH3A407 (amino acid sequence) (SEQ ID NO: __)

10 MDFQVQIFSFLISASVIIARGQIVLSQSPAILASPGKEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPTPTFGAGTKLELKDGGGSGGGGSGGGGSSQAYLQQSGAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPGNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAYVFCARVVYYSNSYWFYFDVWGTGTTVTVSSDQEPKSSDK
15 THTSPSPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV
DQVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTTTPPVLDSDGSFFLASKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLS
PGK

20

2H7 scFv MTH (SSS) WTCH2MTCH3Y405A407 (nucleotide sequence) (SEQ ID NO: __)

aaagctggcccatggatttcaagtgacgatttcagcttctgctaatcagtgcttcagtcataattgccagaggacaaattgttctct
cccagctccagcaantcctgctgcacatccagggggaagggtcacaaatgacttcagggccaagctcaagtgtaagtacatgcaat
25 ggtaccagcagaagccaggaatcctcccccacccctggalltatgccccacaaacctggcttcgagtgacctgctcgtcgttcagtg
gcagtggtgctgggacctctactctctcacaalcacagcagtgaggagctgaagatgctgccactattactgccagcagtggaagtt
taaccacccaccggttcgggtgctgggaccaagctggagctgaagatggcggtggctcgccgggtggtggatctggaggaggtg
ggagctcicagggctatctacagcagctggggctgagctgggtgagggctgggacctcagtgaaagatgctcgaaggcttctggc
tacacatttaccagtgtaacaatgatcactgggtaaacgagacacactagacaggcgctggatggatggagctatttatccaggaat
30 ggtgatacttctacaatcagaagttcaaggccaaggccacactgactgtagacaaaatctccagcacagcctacatgcaagctcag
cagcctgacatctgaagactctcggtctatttctgtgcaagagtggtgtactatagtaactcttactgtaactctgctgtggcgac

PCT/US2003/041600

aggggaccacgggtcaccgtctctctgatcaggagcccaatctctgcacaaactcacacatcccaccgtgccagacctgaac
tctctgggggaccgtcagctctctcttcccccaaaaacccaaggacacctcatgatctccggaccctcaggtgcacatcgtcgt
gtgtgtgacgtgagccacgaagacctgaggtcaagtctcaactggtagctgtgacgcgtggaggtgcataatgcgaagacaaag
ccgcggagagagcagtacaacagcacgtaccgtgtgtcgtacgtctcaccgtctgtcaccaggactgtctgaatgcgaaggga
gtacaagtgcaggcttccacaagaagccctcccagccccatcgcagaaaaaatctccaaagccaaaggcagccccgagaac
cacagggtacacctgccccatcccgggaggagatgaccaagaacacgtcagcctgacctgacctgtcaaaggctcttatcc
cagcgacatcgcctgtggagtgaggagacaaatggggaccgggagaaactacaagaccacgtctccgtgtggaactccgac
ggctctcttacctcggcagcaagctcaccgtggacaaagacaggtggcagcaggggaacgtctctcatgtctcgtgatgcgat
aggctctgcacaaccactacacgcagaagaagccctctccctgtcccccgtaaatga

10

2H7 scFv MTH (SSS) WTCH2MTCH3Y405A407 (amino acid sequence) (SEQ ID NO:)

15 MDFQVQIFSLLISASVIIARGQIVLSQSPAILASASPGKEVTMTCRASSSVSYMHWY
 QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEADAATYYCQQWS
 FNPTFGAGTKLELKDGGSGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
 TAYMQLSSLTSEDSAVYFCARVYYYSNSYWFYFDVWGTGTTVTVSSDQEPKSSDK
 THTSPSPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV
 DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
 20 KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
 NYKTTPTPLDSDGSFYLAASKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLSLS
 PGK

2H7 scFv MTH (SSS) WTCH2MTCH3A405A407 (nucleotide sequence) (SEQ ID

25 NO:)

aaagcttccgcacatgattttcaagtgcaagatttcagcttctgtaactcagtgcttcagtcataattgccaggagcaaaattgtctct
 ccacagttccacgcaatctctctgcatctccaggggaggaaggtcacaatgacttgcaggccagctcagaagtgaagttacatgact
 ggtaccacgagaagccagatctcccccacacctgcattatgcccatccaacctgctcttggaggtccctgctcgttcacgtg
 gcagtggtgctgggaccttactctctcacaatcagcagagtgaggaggtgaagatgctgccacttattactccagcagtgaggatt
 taaccacccacgctgggtgctgggaccaagctggagctgaaagatggcggtgctcgggcggtggatctggaggagtg
 ggaagctctcagcgttactcaacacagctctgggctgaactgtgaagcctctggcctcagtgaaatgctctcacaagctcttgc
 30

WO 2005/017148

PCT/US2003/041600

tacacattaccagttacaatafgcactgggtaaaagacacactagacaggccctggaatggatfggagctattatccaggaaat
 ggtgatacttcacaaacagaagttcaaggccaagccacactgactgtagacaaatctccagcacagccatcatgcagctcag
 cagcctgacatctgaagactctgcggctatttctgtgcaagagtggtgtactatagtaactcttactggtacttcgatgtctggggcac
 agggaccacgggtaccgtctctctgtatcaggagcccaatcttgacaaaactcacacatccccaccgtccccagcacctgaac
 5 tctggggggaccgtcagttctctctctcccccacaaacccaagacacccatcatgatctcccggacccctgaggtcacatcgctg
 gttgtggacgtgagccacgaagaccctgaggtcaagttcaactggtacgtggacggcgtggaggtgcataatgccaaagaaa
 ccggggagggagcagfacacagcacgtaccgtgtgtggtcagcgtctcacctgctgcaccaggactggctgaatggcaaggga
 gtacaagtgcaaggtctccaacaagccctcccgccccatcgagaaaacaatctccaaagccaaaggcgagcccgagaaac
 cacaaggtgtacacccgtccccatccggggagagatgaccaagaaccagggtcagcctgaactgctgggtcaaaagggttctatcc
 10 cagcgacatcgccgtggagtgaggagacaatggcgagccgggaacaactacaagaccacgctcccggtcgtgactccgac
 ggtctcttcgccctgccacaagctaccgtggacaagagcaggtggcagcaggggaacgtctctcatgctccgtgatgcatg
 aggtctctgcacaaccactacacgcagaagagcctctccctgtcccgggtaaatga

2H7 scFv MTH (SSS) WTCH2MTCH3A405A407 (amino acid sequence) (SEQ ID

15 **NO: __)**
 MDFQVQIFSFLLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
 QQKPGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
 FNPPTFGAGTKLELKDGGGSGGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
 20 TAYMQLSSLTSEDSAVYFCARVYYNSYWFYFDVWGTGTTVTVSSDQEPKSSDK
 THTSPSPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV
 DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
 KTISKAKGQPREPQVYTLPPSRBEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
 NYKTTTPVLDSDGSFALASKLTVDKSRWQQGNVFSQSVMEALHNHYTQKSLSL
 25 PGK

2H7 scFv MTH (SCC) WTCH2CH3 (nucleotide sequence)

aagcttgcgccatggaatttcaagtgcaagtttcaagctctctgtaatacagtgcttcagtcataattgccagaggacaattgttctct
 ccagatctccagcaatctgtctgcacatccagggggaaggtcacaatgacttgcagggccagctcaagtgtaagtatcatgcact
 30 ggtaccagcagaagccagatctcccccacccctggatttatgcccatccaacctgctcttcggagctccctgctcgttcagtg
 gcagtggtgctgggacctcttactctctcacaatcagcagatgggaggtgtaagatgctgccacttattactccagcagtgaggatt

WO 2005/017148

PT/US2003/041600

taaccaccaccagcttcggctcgggaccaagctggagctgaaagatggcggctggcggctggctggaatcctggaggaggtg
ggagctctcaggttatctacagcagctcgggctgagctggfagggcctggggcctcagfagaatgctcctcaaggctctctggc
tacacattaccaggttacaatatgcactcggtaaagcagacacctagacagggcctggaatggattggagctattatccaggaaat
5 ggtgatacttctacaatcagaagttcaaggcgaaggccactgactgtagacaaatctccagcacagcctacatgcagctcag
cagcctgacatctgaagactctgcgctctattctgtgcaagagtggtgactatagtaactcttactgtaactcctatgctcgggac
aggaccaccgctcaccgtctctctgacagagcccaaatctctgacaaaactcacatgccaccgtgcccagcactgaaac
tctcgggggacgctcagctctctctctcccccacaaacccaaggacacctcatgatctccggaccacctgaggtcacatcggtg
gtggtgagcgtgagccaggaagacctgaggtcaagttcaactggtacgtgagcggcgtggaggtgcataatgccaaagacaaag
ccggcgaggagcagctacacagcagctaccgtgtggtcagcgtctcaccgtctgcaccaggacgtgctgaatggcaaggga
10 gtacaaggtcaaggtctccaacaagcctccagcccccacgagaaaacaatccaaagccaaggcgacggcccgagaaac
cacagggtgacacctcgtcccccacccggatgagctgaccaagaaccaggtgacgctgacctgctggtcaaggctctatcc
cagcgacatcgtccgtgaggtggagagcaatggcgagccggagaaactacaagaccacgctcccggtgctggactccgac
ggctctctctctctacagcaagctcaccgtggacaagagcaggtggcagcagggggaactctctcatgctcctggtgcatga
ggctctgcacaaccactacacgagaagagcctctccctgtctccgggtaaatgatctaga

15

2H7 scFv MTH (SCC) WTCH2CH3 (amino acid sequence)

MDFQVQIFSLISASVIIARGQIVLSQSPAILASAPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPTFTGAGTKLELKDGGSGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
20 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYYSNSYWFYDVGWGTGTTVTVSSDQEPKSSDK
THTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREBQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
25 NNYKTTTPVLDSGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLSL
SPGK

2H7 scFv MTH (CSC) WTCH2CH3 (nucleotide sequence)

aagcttgcgcccatggaatttcaagtcagatfttcagcttctgctaatcagtgcttcagctacataatgccagaggacaaattgtctct
30 cccagctccagcaatctctgctcatctccaggggagaggtcacaatgacttgaggccagctcaagtgtaagtacatgcact
gtgacagcagaagccagatctctccccaacacctggattatgcccatcaacctggcttcggagctcctgctcgtctcagtg

PCT/US2003/041600

5

10

15

2H7 scFv MTH (CSC) WTCH2CH3 (amino acid sequence):

20

25

2H7 scFv MTH (CCS) WTCH2CH3 (nucleotide sequence)

30

WO 2005/017148

PCT/US2003/041600

ggtaccagcagaagccagatctccccaaacctggattatgccccatccaacctggtcttgagtcctctgctcgttcagtg
gcatgtggtctgggacctcttactctctcacaatcagcagatgtggagctgaagatgctgccacttattactgccagcagtgaggatt
taaccacccacgcttcggtgctgggaccaagctggagctgaaagatggcggctgctcggcggtgggtgatctggaggaggtg
ggagctctcagcgttatctacagcagctcgggctgagctgagggcctggggcctcagtgaaagatctctcgaaggtctctggc
5 tacacattaccagttacaatgatcactgggtaagcagacactagacaggcctggaatggattggagctattatccaggaat
ggtgatactctacaatcagaagtcaaggcgaagccacactgactgtagacaatctccagcacagcctacatgcagctcag
cagcctgacatctgaagactctgcggtctattctgtgcaagagtggtgtactatagtaactcttgacttctgatgtctgggcac
aggggaccacgctcaccgtctctctgatcaggagcccaaatctgtgacaaaactcacatgtccaccgtccccagcacctgaac
tctggggggaccgtcagctctctctcccccaaaacccaaggacacctcatgatctccggacccttgaggctcacatgcgtg
10 gtgtggagctgtagccacgaagacctgaggtcaagttcaactgtgtacgtggcggcggtggaggtgcataatgccaaagacaag
ccggcgaggagcagctacaaacagcagctaccgtgtgtcagcgtctcaccgtctgacacaggcactggctgaatgcaagga
gtacaaggtcgaaggtctccaacaagcctccagcccccatcgagaaaacaaatccaaagccaagggcagcccgagaaac
cacagggttacacctgccccatccccgggatgagctgaccagaaccaggtcagcctgacctgcctggtcaaggtctctatcc
cagcgacatcggcgtggagtgaggagagcaatgggcagccgggagaacaactacaagaccacgcctcccggtgctggactccgac
15 ggtctctctctctacagcaagctcaccgtggacaagcaggtggcagcaggggaacgtctctcatgctccgtgatgcatga
ggctctgcacaaccactacacgcagaagagcctctccctgtctccgggtaaatgatctaga

2H7 scFv MTH (CCS) WTCH2CH3 (amino acid sequence)

MDFQVQIFSLISASVIIARGQIVLSQSPAILASPGKEVMTMTCRASSVSVMHWY
20 QQKPGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPTTFGAGTKLELKDGGSGGGGGGGSSQAYLQQSGAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFYFDVWGTGTTVTVSSDQEPKSCDK
THTCPPAPPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWY
25 VDGVEVHNAKTKPREQYNSTYRVVSVLTVLHQDWLNGKEYCKVSNKALPAPI
EKTISKAKGQPREPVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSSVMHEALHNHYTQKSLSL
SPGK

30 **HuIgAHlgA-T4-ORF (nucleotide sequence)**

WO 2005/017148

PT/US2003/041600

gtatcagccaggttcctcaactccacaccccatctccctcaactccacctaccccattccctcatgctgccaccccccgaactgtca
ctgcaccgaccggccctcgaggacctgctcttaggttcagaagcgaatctcacgtgcacactgaccggcctgagagatgctcag
gtgtcaccttcacctggacgacctcaagtgggaagagcgtgtcaaggaccacctgaccgtgacctctgtgctgtctacacgtg
tcacgtgtctcctcgccggctgtgcgagccatgggaacatgggaagaccttcacttgctgctgctaccccgaatccaaagacc
5 cgcclaacccgacacctctcaaaatcgggaacacattccgcccgaggtccacctgtgccgcccccctggagggagctggccc
tgaacgagctgggtgacgtgactgctgctggcacgtgttcagcccaaggatgtgtgctgctgctgctgacggggctacagg
agctgcccccgaggaagtacctgacttgggcatcccggcagagcccaaccagggcaccaccaccttcgtgtgaccagcata
ctgcgcgtggcagccgagactgggaagaggggacaccttctctgcatggtggccacgagggcctgccgtgaccttcac
acagaaagaccatcgaccgctgtggcgggtaaacccacccatgtcaatgtgtctgtgtcagcggagggtggacgcggalcccttga
10 ac

HuIgAHlgA-T4-ORF (amino acid sequence)

DQVPVSTPTPTSPSTPTPTSPSCCHPRLSLRPALEDLLGSEAILTCTLTGLRDSGV
TFTWTPSSGKSAVQGPDRDLGCGYSVSVLPGCAEPWNHGKFTTCTAAYPESKT
15 PLTATLSKSGNTRFRPEVHLLPPPSEELALNELVLTCLARGFSPKDVLRVRLQGSQ
ELPREKYLTWASRQEPSQGTTFVAVTSLRVAEDWKKGDTFSCMVGHEALPLAF
TQKTDIDLAGKPTHVNVSVVMAEVDADPSN

1D8-IgAH IgA-T4-CD80 (nucleotide sequence)

20 aagccttatggaatttcaagtcgagatttcagcttctctgaatcagcttcagtcataatgtccagagagtcgacattgtgtcactc
agtctcccaacaacatagctgcatctccagggggaaggtcaccatcacctgccgtgccagctccagtgtaagtacatgtactggt
accagcagaagtcagcggcctcccctaaactctgatttatgacacatccaagctgcttctggaattccaatcgtctcagtgga
gtgggtctgggaacctctattctctcgaatcaacacatggagactgaagatgctgccacttactctcagcagtggaatgact
ccgcacagtctgggtctgggacaaagctggagatcaaacgggggtggcgggtgctggcgggtggtgggtggcggcgg
25 gatctcaggtgagcgtgaaggagggcagacctggcctggfgaaccggacacagacctgtccctccatgacactgtctctgggt
ctcattaccagcagatggtgtgactgactgacagcgtccaggaagggtctgggaatgagtggaataatataattatgatgaggg
cacagattataatcgaattaataccagactgagcatcagcagggaacacctccaaggccaagtgtttcttaaaatcaacagctctg
caaactgatgacacagccatgtattactgtgccagaatccattgtattactggggccaaggagtcaggtcagctgtcctctgato
aggcaggttccctcaactccacctaccctatctcctcaactccacctaccctatctcctcatgctgccacccccgactgtcactgca
30 ccgaccggccctcgaggacctgctcttaggttcagaagcgatctcagctgcacactgaccggcctgagagatgcctcaggtctc
accttcacctggacgccctcaagtggggaagcgtgttcaggaccacctgaccgtgacctctgtgctgtacagcgtgtcca

WO 2005/017148

PCT/US2003/041600

gtgtcctgcggcgtgtgtccgagccatggaacatgggaagaccttcactgcactgctgctaccgccgagtcacagaccccgct
aacggccacccctctcaaaatccgggaacacatccggccgaggtccacctgtctgccgcgccgtcgcgaggaactgcccctgaa
cgagctgggtgacgctgacgtgacctggcacgtggttcagcccaaggaatgtgtgttcgctgctgcaggggtcacaggagct
gcccgcggaagaagtactgacttggcatcccgacgagggccagccaggggaccaccacctctcgtgtgaccagcatactgc
5 gctggcagccgaggaactggaagaagggggacaccttctctgcactggtggccacgagggccctccgctgacctcacacag
aagaccatcgaccgttggcgggtaaacccacctatgcaatgtgtctgttgcacggcgagggtggacgggaltctcgaacaa
cctgtcccatctcgggccattacctaatactcagtaaatggaaattttgtgatatgctgacctactgcttggcccaagatgcag
agagagaaggaggaatgagagattgagaagggaagtgtacgccctgtataaatacgatac

AA

10 **ID8 scFv IgAH IgA-T4-CD80 (amino acid sequence)**

MDFQVQIFSFLLISASVIMSRGVDIVLTQSPTTIAASPGKEVVTITCRASSVSVMYWY
QQKSGASPKLWYDTSKSLASGVPNRFSGSGSGTSYSLAINTMETEDAATYYCQW
SSTPLTFSGTGKLEIKRGGGGSGGGSGGGSGVQLKEAGPGLVQPTQLSLTCTV
SGFSLTSDGVHWIRQPPGKGLEWMGIYYDGGIDYNSAIKSRLSISRDTSKSQVFLK
15 INSLQTDDTAMYYCARIHFDYWGQGVMTVSSDQVPSPPTPTSPSTPPTPSPSCC
HPRLSLHRPALEDLLLGSAILTCLTFLGRDASGVTFWTWPSSGKSAVQGPDRDL
CGCYSVSSVLPGAEPWNHGTKFTCTAAYPESKTPLTATLSKSGNTFRPEVHLLPP
PSEELALNELVTLTCLARGFSKPDVLVRWLQGSQELPREKYLWASRQEPSQGT
FAVTSILRVAEDWKKGDTFSCMVGHEALPLAFTQKTIDRLAGKPTHVNVSVVM
20 AEVDADPSNNLLPSWAITLISVNGIFVICCLTYCFAPRCRRRRNRRLRRESVRPV

human IgE Fc (CH2-CH3-CH4) ORF (nucleotide sequence)

tgatcacgtctgtctccagggaacttaccgccaccgtggaagatttaccatgctgctctgcgacggcgccggcggaacttccccg
accatccagctcctgtgctcgtctctgggtacacccagggaactatcaatcacctgctgctggagggacggcgatcaggacg
25 tggactgtgccaccgctctaccacgacgaggggtgagctggctccacacanaagcgagctaccctcagccagaagaactggc
tgtcagaccgcacctacacgtccaggtcacctatcaaggtcacaccttgaaggacacaccaagaagtgtgcaattccaacc
gagaggggtgagcgectactaagccggccaccgccgttgacctgttcatccgaagtcgccacgatcctgtctggtggtg
gacctggcaccacgacgaaggaccgtgaacctgacctgtccggccagtgaggagcctgtgaaccactcaccagaaagg
aggagaagcagcgcaatggcactgtaacctgacgtccacctgcccgtggcgacccgagactggatcagggggagaccta
30 ccagtgacagggtgaccacccccacctgccaggggccctcatgcgtgccacgaccaagaccagcggcccgctgctgccccg
gaagtctatgcgtttgcgacgccgagtgccggggagccgggacaaagccacccctgcctgctgatccagaaactcatgcct

WO 2005/017148

PCT/US2003/041600

gaggacatctcgggtgcagtgctgcacaacgaggtgcagctcccgagcccgccagacacgacgagccccgcaagacc
aagggtctccggctctctcttcacggccctggagggtgaccaggccgaatgggagcagaagaatgagttcatctccggtgcag
tcatgaggcagcgagccccacagaccgtccagcgagcgggtgtctgtaaatcccggtaaagcggatccttcgaa

AA

- 5 **human IgE Fc (CH2-CH3-CH4) ORF (amino acid sequence)**
DHVCSRDFTPPTVKILQSSCDGGGHFPPTIQLLCLVSGYTPGTINITWLEDGQVMDV
DLSTASTTQEGELASTQSELTLSQKHWLSDRITYTCQVITYQGHTFEDSTKKCADSN
PRGVSAYLRSRPSFDLFIKRSPTITCLVVDLAPSKGTVNLTWSRASGKPVNHSTRKE
EKQRNGTLTVTSTLPVGRDWIEGETYQCRVTHPHLPRALMRSTTKTSGPRAAPE
- 10 VYAFATPEWPGSRDKRTLACLIQNFMPEDISVQWLHNEVQLPDARHSTTQPRKTK
GSGFFVFSRLEVTRAWEQKDEFICRAVHEAASPSQTVQRAVSVNPGKADPS

1D8 scFv-human IgE Fc (CH2-CH3-CH4)-CD80 (nucleotide sequence)

- aagctatggatttcaagtcagatttcaagcttctgtaatacagtgcttcagtcataatgtccagaggagtcgacattgtctcactc
- 15 agtctccaaacaccatagctgcatctccaggaggagagtcaccatcacctggcgtgcaggtccagtgtaagttaactgtaactgtg
accagcagaagtcagcgccctccctaaactctggattatgacacalccaaagctgcttctggaggtlccaaatcgcttcagtgga
gtgggtctgggacctcttattctctcgaatcaacaccatggagactgaagatgctgccaatttactgtcagcagtgaggtagtact
ccgtcacgttcgggtctgggaccaagctggagatcaaacgggggtggcggcggcgggtgggtgggtgggtgggtggcggcg
gatctcagtgtagctgaaggaggcaggacctggcctggtgaaccgacacagacctgtccctcacatgcactgtctctgggtt
- 20 ctcattaaccagcgatggtgtacactggattcagacgctccaggaagggtctggaatgagggaalaaatattatgaggag
cacagattataatcagaattaaatccagactgagcatcagcaggacacctccaaagagccaagtgtttctaaaaatcaacatctg
cnaactgatgacacagccatgtattactgtccagaatccactttgattactggggccaaggagtcagtgcaacgtctctctgatc
acgtctgctccagggtacttccccccaccgctgaagatttaccagtgctctcgtgcagggcgccggcgaacttccccccaccat
ccagctcctgtgctctgctctgggtacacccagggactatcaacatcacctgggtggagagacggcaggtcatgagacgtggac
- 25 ttgtccaccgctctaccacgcaggagggtgagctggcctccacacaaaagcagctcaccctcagccagaagcactggcgtgca
gaccgcacctacacctgacagtcacctatcaagggtcacacctttgaggacagccaaagaagtgtgcagattccaaccgcagag
gggtgagcgctaccataagccggccagcccttgacacctgttcatccgcaagtcgccacgacacctgtctggtggtgaccl
ggcaccacgaagggggacctgtgaacctgacctggtccgggacagtggaagcctgtgaaccacttcaccagaaaggaggag
aagcagcgcaatgacgtttaaccgtcacgtccacctgcccgggtggcaccggagactggatgagggggagacactaccagtg
- 30 cagggtgacccacccccacctgccaggccctcatgctggtccacgaccaaggaccagcgcccggtgtgctgcccgggaagtct
atgcgtttgcgacgccgaggtggcggggagccgggacaagcgccacctgacctgctgattccagaattcatgctgaggac

WO 2005/017148

PCT/US2003/041600

atctgggtgcagtggtctgcacacgagggtgcagctcccggagcccccggcacagcacgacgagccccgaagaccaagggct
ccggctctctcgtcttcacgccgcctggagggtgaccaggccgaatgggagcagaagatgagttcatctgccgtgcagtcctatga
ggcagcggagccctcagacaccgtccagcgagcgggtgctgtaaatcccgtaaagcggatccttcgaagctcccatctcgggc
cattacctaatctcagtaaatggaaatttttgatgctgctgacctactgctttgcccccaagatgcagagagagaaggaggaatg
5 agagattgagaagggaagggtgtacgcccctgtataaatcgata

1D8-scFv-human IgE Fc (CH2-CH3-CH4)-CD80 (amino acid sequence)

MDFQVQIFSLFLISASVMSRGVDIVLTQSPPTTIAASPGKEVITICRASSSVSYMYWY
QQKSGASPKLWIYDTSKLGASGVPNRFSGSGSGTSYSLAINTMETEDAATYYCQQW
10 SSTPLTFGSGTKLEIKRGGGSGGGSGGGGSGVQLKELAGPLVQPTQTLSLTCTV
SGFSLTSDGVHWIRQPPGKGLEWMGIIYDGGTDYNSAIKSRLSISRDTSKSQVFLK
INSLQTDITAMYYCARIHFDYWGQGVMTVTVSSDHVCSRDFTPPTVKILQSSCDGG
GHFPPTIQLLCLVSGYTPGTINITWLEDQVMDVDLSTASTTQEGELASTQSELTLS
QKHWLSDRITYTCQVITYQGHTFEDSTKKCADSNPRGVSAYLSRPSFDFLRKSPITI
15 TCLVVDLAPSKGTVNLITWSRASGKPVNHSTRKEEKQRNGJLTVTSTLPVGTDRDWI
EGETYQCRVITHPLPRALMRSTTKTSGPRAAPEVYAFATPEWPGSRDKRTLACLI
QNFMPEDISVQWLHNEVQLPDARHSTTQPRKTKGSGFFVFSRLEVTRAWEQKDE
FICRAVHEAASPQTQRAVSVPNGKADPSKLPFWAITLISVNGIFVICCLTYCFAP
RCRERRRRNERLRRESVRPV

20

5B9-IgAII IgA-T4-CD80 (nucleotide sequence)

aagcttgccgccatgaggttctctgctcagctctggggctgcttgctctggatccctggaaccactgcagatattgtgatgacga
ggctcgcaattccatccaggcactcttggaacatcagctccatctcctgcagctctagtaagagctcctcatagtaattggcaca
cttattgtattgtaictgcagaagccaggccagctcctcctcagctcctgatttatcagatgtccaaacctgcctcaggagtcaccagaca
25 ggttcagtagcagtgggcagggaactgatttcacactgagaatcagcagagtgaggagctgaggatgtgggtttattactgtgctc
aaaactcagaactccgctcagctcgtgctgggaccaagctggagctgaaacggggctggcgtggctcggcggtgtgtgggt
cgggtggcggcggaatgctcagagtgagcgtgaagcagtcaggacctggcctagtgcagctcctcacagagcctgtccatcacct
gcacagctctctggtttctcatfaactacctatgctgtacactgggttcgccagctccaggaaagggtctggagtgctgggagtgat
atggagtggtgggaatcacagactataatgcagcttccatccagactgagcatcaccagaagacgattccaagagccaagttttctt
30 aaaatgaacagctgcgaacctatgacacagccatttatactgtgccagaatgggggtgataactacctcttattactatgatatga
ctactgggtcaagggaacctcagtcaccgtctcctctgatacaggcagttccctcaactccactacccatctccctcaactccact

WO 2005/017148

PCT/US2003/041600

accccattccctcagctgccacccccgactgtcactgcaccgaccgcccctcagagacctgcctttagtctcagaagcgaatcct
cactgtgcacactgaccggcctgagagatgcttcagggtgtcacttcacctggacgcccctcaagtgggaagagcgtgticaagga
ccacctgaccgtgacctctgtggctgtctacagcgtgtccagtgtctgccgggctgtgccgagccatggaacctatgggaagacctt
cacttgactgtgctctaccccgactccaagaccccgttaaccgccaccctctcaaaatccggaaacacatccggcccgaggtgc
5 cactctgtgccgccgccctcgaggagctggtccctgaacgagctggtgacgctgactgctgtgcacgtggtctcagcccca
ggatgtgtctgttcgtgctgtcagggtgcacaggagctgccccgcgagaagtactgacttgggcatccggcgagagccca
gccaggcgaccaccaccttcgtgtgaccagcactgctgcgtggcagccgaggactggaagaagggggacaccttctctgc
atggtgggcaccgaggccctgccgtgcttcacacagaagaccatcgaccgcttggcgggtaaacccaccatgtaaatgtgt
ctgttgatgacggcggaggtggacgggactccttcgaacaacctgctcccatcctgggcatcttaactcagtaaatggaaatgtt
10 gtgatgactgacctgactctgcttggcccaagatgcagagagaaggaagggaatgagagaltgagaagggaagtgtacgcc
ctgtataaatcgatac

5B9-IgAH IgA-T4-CD80 (amino acid sequence)

MRFSAQLGLLVLPWGSTADIVMTQAAFSNPVLTGTSASISCRSSKSLLSHNGITY
15 LYWYLQKPGQSPQLLIYQMSNLASGVPDRFSSSGSGTDFTLRISRVEAEDVGVYYC
AQNLELPLTFGAGTKLELKRGGGSGGGSGGGSSQVQLKQSGPGLVQSSQSLS
ITCTVSGFSLTTYAVHWVRQSPGKGLEWLGVWSGGITDYNAAFISRLSITKDDSK
SQVFFKMNSLQPNDAIYYCARNGGDNPYYYYAMDYWGQTSVTVSSDQVPVST
PPTPSPSTPPTPSPSCCHPRLSLHRPALEDLLGSEAILTCTLTGLRDASGVITFTWTPS
20 SGKSAVQGPDRDLGCGYSVSSVLPGCAEPWNHGKTFCTCTAAYPESKTPLTATLS
KSGNTFRPEVHLLPPPSEELALNELVTLTCLARGFSPKDVLRWLQSGQELPREKY
LTWASRQEPSQGTTTFAVTSILRVAEDWKKGDTFSCMVGHEALPLAFTQKTIDR
LAGKPTHVNVSVVMAEVDADPSNNLLPSWAITLISVNGIFVICCLTYCFAPRCRER
RRNERLRRESVRPV

25

5B9-scFv-human IgE Fc (CH2-CH3-CH4)-CD80 (nucleotide sequence)

aagcttgcgcccatgagggttctctgctcagcttctgggctgcttgtgctctggatccctggatccactgcagatattgtgatgacgca
ggtcgtcatctccaatcagtcactcttggaaatcagcttccatctctcgaggtctagtaagatctcctacatagtaattgcatca
cttatttgtatgtgatctgcagaagccaggccagctctcctcagctcctgattatcagatgccaaacctgctcaggagatccacagca
30 ggttcagtagcagtggtcaggaaactgatttcacactgagaatcagcagagtgaggcgtgagatgtgggtgttattactgtgtc
aaaactcgaactccgctcagcttggctgtgggaccaagctggagctgaaacgggggtggcgtggctcggcggtgtgtggt

PCT/US2003/041600

20 **5B9-scFv-human IgE Fc (CH2-CH3-CH4)-CD80 (amino acid sequence)**

355

WO 2005/017148

PT/US2003/041600

2e12-scFv-IgAH IgA-T4-CD80 (nucleotide sequence)

aagcttatggatttcaagtcgacatttccagcttctgtaatacagtcgtcagtcataatgccagaggagtcgacattgctgcaccc
aatctccagctcttggctgtgtctcaggtcagagagccaccatctcctgcagagccagtgaaagtggtgaataattatgtcacaagtt
5 taatgcagtggtaccacaagaaccaggacagccaccacactcctcatctctgctgcataccagtagaacttggtggctccctgcc
agggtttatggcagtggtgctggcagagactcagcctcaacatccatcctgtggaggagtgatattgcaatgtatttctgcagc
aaagtgaggaaagtgcttcggcagcttggtggaggccaagctggaaatcaaacgggggtggcgtgctcgccggggagtgagg
tcgggtgcccgggatctcaggtgcagctgaaggagtcagggacctggcctgggtggcgcctcacagagcctgtccatcacatgc
accgtctcagggtctcattaaccggctatgggtgaaactgggttcgccagcctccaggaaagggtctggagtgctgggaatgat
10 atgggggtgatggaagcacagactataattcagctctcaaatccagactgagcatcaccaaggacaactccaagaccaagtttctt
aaaaatgaacactctgcaaaactgatcacacagccagatactatgtccagagatggtatagtaactttcaactatgttatggact
actggggcaaggaaacctcagtcaccgtctcctcagatcagccagttcctcaactccactaccatctccctcaactccacctta
cccctctcctctatgtgccacccccgactgtcactgcaccgaccggccctcaggacctgtcttagtggtcagaagcgatcctc
acgtgcacactgaccggcctgagagatgcctcaggtgtcaccttcacctggacgccctcaagtggaagagcgctgttcacaggac
15 cactgcacgtgacctctgtgctgtacagcgtgtccaggtgtcgtgcggcgtgtgcgcgacatggaacatgggaagaccttc
acttgcactgtgcctaccggagtcgaagaccccgctaacccgacccctctcaaaatccggaacacactatccggcccgagggtcc
acctgctgccgcgcgcgtggagggagctggccctgaacgagctggtgacgtgacgtgccttgacgtgtgctcagccccag
gatgtgtggtgtcgtggctgcagggtgcacaggagctgccccgcgagaagtacctgacttggtgcacccggcagagccccag
ccaggggcaccaccaccttcgtgtgaccagcatctgcgcgtgcaagcogaggactggaagaagggggacaccttctcctgcat
20 gttggggccacgagggcctgccgtggccttcacacagaagaccatcgaccgttgccgggtaaacccaccatgtcaatgtgtct
gtgtcatctggcgaggtggagcgggatccttcgaacaacctgtccccatctggccattaccttaatctagtaaatgtgaattttgt
gatattgctgctgacctactgtttcccccaagatgcagagagagaagaggaaatgagagattgagaagggaagtgtacgccct
gtataaatcgatac

25 2e12-scFv-IgAH IgA-T4-CD80 (amino acid sequence)

MDFQVQIFSLLISASVIMSRGVDIVLTQSPASLAVSLGQRATISCRASESVEYYVTS
LMQWYQKQKPGPPKLLISAASNVESGVPARFSGSGSGTDVSLNIHPVEEDDIAMFY
CQQSRKVPWTFGGGTGLEIKRGGGSGGGGSGGGGSGVQLKESGPGLVAPSQSL
ITCTVSGFSLTGYGVNWVRQPPKGLEWLGMIWGDGSTDYNSALKSRISITKDNS
25 KSQVFLKMNSLTDDTARYYCARDGYSNFHYVMDYWGQGTSTVTVSSDQVPVS
TPPTPSPSTPPTPSPSCCHPRLSLHRPALEDLLGSEAILTCTLTGLRDSAGVTFTWTP
SSGKSAVQGPDDRDLGCGYSVSSVLPGCAEPWNHGKFTICTAAYPESKTPLTATLS

WO 2005/017148

PCT/US2003/041600

KSGNTFRPEVHLLPPSEELALNELVTLTCLARGFSPKDVLRWLQGSQELPREKY
LTWASRQEPSQGTTFITFAVTSILRVAEDWKKGDTFSCMVGHEALPLAFTQKTIDR
LAGKPTHVNVSVVMAEVDADPSNNLLPSWAITLISVNGIFVICCLTYCFAPRCRER
RRNERLRRESVRPV

5

2e12-scFv-human IgE Fc (CH2-CH3-CH4)-CD80 (nucleotide sequence)

aagcttatggaatttcaagtcagattttcagcttctgctaatacagtgctcagtcataaagtcacagagagtcgacattgtctcacc
aatctccagcttcttgctgtgtctctaggtcagagagccaccatctcctgcagagccagtgaaagtgtgtaattatgtcacaagtt
taatgcagtggtaccacagaaacaggacagccaccacaaatctcatctctgctgcatcaacagtagaactggggctccctgcc
10 aggtttatgtgcagtggtgtctggacagacttcagcctcaacatccatcctgtgagagagagatgataattgcaattgatttctgcagc
aaagttaggaaggttcttgcagctcgggtggagcaccacagctggaatcaaacgggtgtgcgggtgctcggcgaggagtggtg
tcgggtggcgcggaatcaggtgcagctgaagagtgacagctggcctgtggtggcgccctcacagagcctgtccatcacatgc
accgtctcaggggttctcattaacgggctatgggtgtaactgggttcgacagcctccaggaaggtgtgagtggtgtgggaatgat
atgggtgatggaagcacagactataattcagctcctcaatccagactgagcatcaccaaggaacaactccaagagccaagtgttctt
15 aaaaatgaacagtgctgcaaatgtagacacagccagatcactgtgcccagagatgggtatgtaacttctattactatgttatgact
actgggtgcaaggaacctcagtcaccgtctcctcagatcacgtctgtccagggacttcacccgccacagtggaagtattacag
tcgtcctgcgacggcgggcgacgtcccccaccatccagctcctgtgctcgtctctgggtacacccaggactatcaaat
cacctgggtggaggaaggcaggtcatgacgtgactgtgtccaccgctctaccacgacgaggggtgaagctggctccacac
aaagcgagtcacccctcagccagaagcactggctgtcagaccgacctacacctgccaggtcacctatcaaggtcacacatttga
20 ggacagcaccaagaagtgctgacattccaaccgagaggggtgagggcctacctaaagcggoccaagccgttcgacctgttc
ccgcaagtgcgccacgacacgtctgtgtgtgagcttgacaccagcaaggggaccgtgaacctgacctgtcccgccga
gtgggaagcctgtgaaccatctccaggaagagggaggaagcagcgcaatggcaggttaacctgacgtccacctgccggtg
ggcacccgagactggatcagggggagacctaccagtgacgggtgacccaccccaactgccaggggccctcagggelcca
cgaccaagaccagcgcccgctgtgctgtccccggaaagtctatgcgtttgcgacggcgaggtggccgggagccgggacaagc
25 gcacccctgctgctgatccagaactcagctgagggacatctcgtgtagtggctgcacaacagaggtgcagctccggagc
ccggcacagcagcagcagccccgcaagaccaagggtccggctctctgtcttcagccgctggaggtgaccagccgggaat
ggagcagcaaaagtgatgattcactgccgtgcagtccatgagcagcagacccctcacagaccgtccagcagcgggtgtctgtaa
atccccgtaagcggaatcttcgaagctccactcctggccattaccttaactcagtaaatggaaatttttgatgtgctgacct
actgctttggcccaagatgcagagagagaaggaggaatgagagattgagaagggaaggtgacggcctgtataaatcgata

30

2e12-scFv-human IgE Fc (CH2-CH3-CH4)-CD80 (amino acid sequence)

WO 2005/017148

PCT/US2003/041600

MDQFVQIFSLLISASVMSRQVDIVLTQSPASLAVSLGQRATISCRASESVEYYVTS
LMQWYQQKPGQPPKLLISAASNVESGVPARFSGSGSGTDFSLNIHPVEEDDIAMFY
CQQSRKVPWTFGGGKLEIKRGGGSGGGSGGGGSQVQLKESGPGLVAPSQSL
ITCTVSGFSLTGYGVNWRQPPGKGLEWLGMIWGDGSTDYNSALKSRLSITKDNS
5 KSQVFLKMNSLQDDTARYYCARDGYSNFHYVMDYWGQGTSTVTVSSDHVCSR
DFTPTVKILQSSCDGGGHFPPTIQLLCLVSGYTPGTINITWLEDGQVMDVDLSTAS
TTQEGELASTQSELTSQKHWSLDRYTCQVTYQGHTFEDSTKKCADSNPRGVSA
YLSRSPFDLFIKSPITITCLVVDLAPSKGTVNLTVSRASGKPVNHSTRKEEKQRNG
TLTVTSTLPVGTDRDIEGETYQCRVTHPLPRALMRSTTKTSGPRAAPEVYAFATP
10 EWPGRDKRTLACLIQNFMPEDISVQWLHNEVQLPDAHRSTTQPRKTKSGGFFVFS
RLEVTRAWEQKDEFICRAVHEAASPSQTVQRAVSVNPGKADPSKLPWAITLISV
NGIFVICCLTYCFAPRCRERRRNERLRRESVRPV

500A2 scFv (nucleotide sequence)

15 atgtgtatatacatcagctccttggccttttactctcttggaattcagcctocagaagtgacatagtgctgactcagactccagccactc
tctctctaattcctggagaagagtcacaaatgacctgtgaagaccagtcagaatattggcacaatcttacactggatcaccaaaacc
aaaggagggtccaagggtctcatcaagtatgcttcgagctcattctcgggatccctccagattcagtgccagtggttcgaaac
agatttcactctcagcatcaataacctggagcctgatgatatcgaatttattactgtcaacaaagtagaagctggcctgcacgttcg
gtcctcggcaccaggctggagataaaacgggtggcgggtggctcggcgagggtgggtcggcgcgatctcaggtcaa
20 gctgcagcagtcocggttctgaactagggaacctgggacctcagtgaaactgtctcgaagacttcaggtcatattcacagatc
actatattcttgggtgaaacagaagcctggagaaagcctgcagtgatagaaatgtttatggtgaaaigtgtgtaacagctaca
atcaaaaattccaggccaaggccacactgactgtagataaaatctctagcacagcctacatggaactcagcagcctgacatctgag
gattctgccatctattactgtgcaagaaggccggtagcgacgggcatgctatggactactgggtcaggggatccaagtaccgt
ctcctctgac

25

500A2 scFv (amino acid sequence)

MLYTSQLLGLLLFWISASRSDIVLTQTPATLSLIPGERVTMTCKTSQNIGTILHWYH
QKPKEAPRALIKYASQSIPGPSRFSGSGSETDFTLSINNLEPDDIGIYYCQQRSWPV
TFGPGTKLEIKRGGGSGGGSGGGSGVQLQSGSELGKPGASVKLSCKTSYGF
30 TDHYSISWVKQKPESLQWIGNVYGGNGGTSYNQKFQKGATLTVDKISSTAYMEL
SSLTSEDSAIYYCARRPVATGHAMDYWGQGIQVTVSSD

WO 2005/017148

PCT/US2003/041600

NT

5' oligo:

Name : IgGWT3

GTTGTTTTCGAAGGATCCGCTTTACCCGGAGACAGGGAGAGGCTCTT

5 NT

3' oligo:

Name : hIgGWT5

GTTGTTAGATCTGGAGCCCAATCTTGTGACAAAACCTCACACATG

NT

10 5' oligo:

Name : FADD5

Sequence

GTTGTGGATCCTTCGAACCCGTTCTCGGTGCTGCTGCACTCGGTGTCG

NT

15 3' oligo:

Name : FADD3

Sequence

GTTGTATCGATCTCGAGTTATCAGGACGCTTCGGAGGTAGATGCGTC

NT

20 **FADD-CSSCFV (nucleotide sequence)**

gtggatccttcgaacccgttcctggtgctgctgcactcgggtgtccagccctgtcagcagcgcgctgaccgagctcaagttccta
tgccctcgggcgcgtgggcaagcgaagctggagcgcgtgcagagcggccctagacctcttccatcgtgctggagcagaacga
cctggagcccgggcacaccgagctcctgcgcgagctgctgcctccctgcgcgcgccagacctgctgcggcgcgtcgacgact
tcgagggcggggcggcggccggggccgcgcctgggggaagaagacctgtgtgcagcatttaacgtcatatgtgataatgtgggg
aaagattggagaaggtgctgctcagctcaaaagtctcagacaccaagatcgacagcatcgaggacagatccccgcgaacctg
acagagcgtgtcgggagtcactgagaatctggagaacacagagaaggaacgaacagtgcccacctgtgtgggggctc
tcaggctcgcagatgaacctgggtgctgacctggtacaagaggttcagcaggcccgtagctccagaacaggagtggggcca
tgtccccgatgcatggaactcagcgcctacccgaagcgtcctgataactcgagatcgataacaac

30 **FADD-CSSCFV (amino acid sequence)**

PCT/US2003/041600

5

GTTGTGGATCCTCCCTTTTGGGTGCTGGTGGTGGTTGGTGTCTGGCTTGCTAT
AGCTTG

GTTGTTTCGAACCCAGAAAATAATAAAGGCCACTGTTACTAGCAAGCTATAGC
AAGCCAG

15 GTTGTGGATCCTCCCTTTTGGGTGCTGGTGGT

GTTGTTTCGAACCCAGAAAATAATAAAGGCCAC

GTTGTGGATCCTCCTGCTCCCATCCTGG

25 GTTGTTTCGAACGGCAAAGCAGTAGGTCAGGC

GTTGTGGATCCTTCGAACCCATTCTGGTGCTGCTGCACTCGCTG

WO 2005/017148

PCT/US2003/041600

MFADD3XC (nucleotide sequence)

GTTGTTATCGATCTCGAGTCAGGGTGTTCAGGGAAGACAC

- 5 **Murine FADD nucleotide sequence** (full length, but without flanking -Ig or transmembrane sequences) (**nucleotide sequence**)

gtggatcctcgaacatggaccattcctggtgctgctgcactcgtgtccggcagcctgtcgggcaacgatctgatggagctcaa
gttcttctgcccgcagcgcgtgagcaaacgaaagctggagcgcgtgcagagtgccctggacctgttcacgggtgctcgtggagca
gaacgacctggagcgcgggcacaccgggctgctgcgcgagttgctggcctcgtgcgcgcacacgatctactgcagcgcctgg
10 acgacttcgaggcggggacggcgaccgctgcgccccggggaggcagatctgcaggtggcatltgacallgtgtgtgacaatg
tggggagagactggaagactggcccgcgagctgaaggtgtctgagcccaagatggatgggatggaggagaagtaacccccg
aagctctgagtgagcgggtaaggagagctctgaaagctggaagaatgctgagaagaagaacgcctcgggtggccgcgactggtca
aggcgcctgcggacctgcagcgctgaatctgtggtgctgacctgtgtggaagaagcccaggaatctgtgagcaagagtgagaatatgt
ccccgactaaggagattcaactgtgtcttctcagaacaccctgactcgagatcgat

15

Murine FADD (amino acid sequence)

VDPSNMDPFLVLLHSLSGSLSGNDLMELKFLCRERVSKRKLERVQSGLDLFTVLL
QNDLERGHTGLLRELLASLRHDLQRLDDFEAGTATAAPPGEADLQVAFDIVCD
NVGRDWKRLARELKVSEAKMDGIEBKYPRLSERVRESLKVWKNAEKKNASVA
20 GLVKALRTRCLNLVADLVEEAQESVSKSENMSPLVRDSTVSSSETP

MCASP3-5 (nucleotide sequence)

GTTGTGGATCCTTCGAACATGGAGAACAAACAAACCTCAGTGGATTCA

- 25 **MCASP3-3 (nucleotide sequence)**

GTTGTTATCGATCTCGAGCTAGTGATAAAAGTACAGTTCCTTTCGT

MCASP8-5 (nucleotide sequence)

GTTGTTTCGAACATGGATTTCAGAGTTGTCTTTATGCTATTGCTG

WO 2005/017148

PT/US2003/041600

MCASP8-3 (nucleotide sequence)

GTTGTTATCGATCTCGAGTCATTAGGGAGGGAAGAAGAGCTTCTTCCG

5 **hcasp3-5(nucleotide sequence)**

GTTGTGGATCCTTCGAACATGGAGAACACTGAAAACCTCAGTGGAT

hcasp3-3 (nucleotide sequence)

GTTGTTATCGATCTCGAGTTAGTGATAAAAATAGAGTTCTTTGTGAG

10

hcasp8-5 (nucleotide sequence)

GTTGTGGATCCTTCGAACATGGACTTCAGCAGAAATCTTTATGAT

hcasp8-3 (nucleotide sequence)

15 GTTGTATCGATGCATGCTCAATCAGAAGGGAAGACAAGTTTTTTCT

1. 2H7 scFv with alternative VHL11 mutations:

Nucleotide sequence

20 Aagcttgccgcacatggatttcaagtcagatgttcagcttcctgctaactcagtcgcttcagtcataattgccagaggacaaaattgtctc
tccagctctccagcaatcctgtctgcatctccaggggagaggtcacaatgacttcagggccagctcaagtgfaagttacatgcac
tggaccagcagaaagccaggtactcccccacccctggatttatgccccatcaaacctggctctgagtcctctgctcgttcagt
ggcagtggtctctgggacctcttactctctcacaatcagcagagtgagggtgaagatgctgccacttattactgccagcagtggaagt
tttaaccacccacgcttggtgctgggaccaagctggagctgaagatggcgggtgctcggggcgtggtggaatctggaggaggt
25 gggagctctcaggttatctacagcagctctggggctgag (one of the following: tcn, acn, gan, can, aan,
cgn, agn)
gtgaggcctggggcctcagtggaagatgtcctgcaaggctctggtcctacattaccagttacaatatgcactgggtaagcagaca
cctagacaggggcctgggaatggaatggagctattatccaggaaatggtgatacttctcacaatcagaaagtcaaggccaaggccac
actgactgtagacaaatctccagcacagcctacatgcagctcagcagcctgacatctgaagactctgggtctattctgtgcaag
30 agtgggtgactatagtaacttactgggtacttgatgctctggggcacagggaccacggcaccgctctctctgatcag

Amino acid sequence

25 MDFQVQIFSLISASVIIARGQIVLSQSPAILASPGKEVTMTCRASSSVSYMHWY
QKQPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
ENPTTFGAGTKLELKDGGGSGGGSGGGSSQAYLQQSGAE (one of the following:
35 S, T, D, E, Q, N, R, K, H)
VRPGASVKMSCKASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFK

WO 2005/017148

PCT/US2003/041600

GKATLTVDKSSSTAYMQLSSLTSEDSAVYFCARVVYYNSNYWYFDVWGTGTTVT
VSSDQ

2. VHL11 deletion

5 Nucleotide sequence:

Aagcttgcgccatggatttcaagtgacagatttcagcttctgctaatacagtgcttcagtcataattgcagagagacaatgtgtctc
tccagcttccagcaatcctgtctgcatctccaggaggagaaggtcacaatgacttgcagggccagctcaagtgtaagttacatgcac
tggctaccagcagaagccaggatctcccccacccctggattatgcccatcccaactgccttcaggatccctgctcctcagtgct
ggcagtggtgtctggaccctctactctctcacaatcagcagagtgagggtgaagatgctgccacttattactgccacagtgaggat
10 tttaaccaccacacgtctgtctgggacccaagctggagctgaagatggcgggtgctcggcggtgtgtgagctatgcaggaggt
gggagctctcaggcttatctacagcagctctggggctgagggtgagcctcgggcctcagtgaaagtgtcctgcaaggctctgct
acacattaccagttacaatgatcactgggtaaacgacacacctagacaggcgctggaatggattgagctattatccaggaaatg
gtgatacttccataacatcagaagttcaagggcaaggccacactgactgtagacaatctctcagcacagcctacatgcagctcagc
agcctgacatctgaagactctgcgtctatttctgtgcaagagtggtgtactatagtaactcttactgtgacttctgatgtctggggcaca
15 gggaccacgggtcaccgtctctcttgatcag

Amino acid sequence:

MDFQVQIFSFLLISASVHARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QKPKGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEADAATYYCQQWS
20 FNPTTFGAGTKLELKDGGSGGGSGGGSGQAYLQSGAEVRPGASVGMKSCA
SGYTFTSYNMHVVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSST
AYMQLSSLTSEDSAVYFCARVVYYNSNYWYFDVWGTGTTVTVSSDQ

3. 2H7 VL L106 with alternative mutations

25 Nucleotide sequence:

aagcttgcgccatggatttcaagtgacagatttcagcttctgctaatacagtgcttcagtcataattgccagaggacaatgtgtctct
cccagcttccagcaatcctgtctgcatctccaggaggagaaggtcacaatgacttgcagggccagctcaagtgtaagttacatgcact
ggctaccagcagaagccaggatctcccccacccctggallatgcccatcccaactcagcttcttggagtgctctgctgctcactg
gcagtggtgtctggaccctctactctctcacaatcagcagagtgagggtgaagatgctgccacttattactgccagcagtgagtt
30 taaccacccacgttctggtctgggaccaagctggag (tcn, agn, aan, cgn, can, gan, and non-natural
derivatives of these codons) aaagatggcggtgctcggcggtgtggatctggaggaggtggagctc

Amino acid sequence:

MDFQVQIFSFLLISASVHARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
35 QKPKGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEADAATYYCQQWS
FNPTTFGAGTKLE (S, T, R, K, H, Q, N, D, E, and non-natural derivatives of these
amino acids at position 106)KDGGSGGGSGGGSS

4. VL L106 deletion

40 Nucleotide sequence:

Aagcttgcgccatggatttcaagtgacagatttcagcttctgctaatacagtgcttcagtcataattgccagaggacaatgtgtctc
tccagcttccagcaatcctgtctgcatctccaggaggagaaggtcacaatgacttgcagggccagctcaagtgtaagttacatgcac
tggctaccagcagaagccaggatctcccccacccctggallatgcccatcccaactcggcttctggagtgctcctgctcctcagtg
ggcagtggtgtctggaccctctactctctcacaatcagcagagtgagggtgaagatgctgccacttattactgccacagtgaggt
45 tttaaccacccacgttctggtctgggaccaagctggagaaagatggcggtggtcggcggtgtgtgagctggaggaggtgg
gagctc

Amino acid sequence:

WO 2005/017148

PT/US2003/041600

MDFQVQITFSLILISAVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QKPKGSPKPYIAPSNLASGVPARFSGSGGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLEKDDGGSGGGSGGGGGSS

5. **IgE CH3 CH4**

Nucleotide sequence:

10 tccacccgagaggggtgagcgctacctaagccgcccagcccgctgacactgttcatccgaagtgcgccagatcacctgtc
tgggtgtgacctgtgacccagcaaggggaccgtgaacctgacctgtgccggccagtgaggagacctgtgaacctccacc
agaaaggagggagagcagcgcaatggcacgttaaccgtcacgtccacctcgccgtggggaccaccgagactggatcgaagggg
15 agacctaccagtgacgggtgaccacccaccactgccacgggcccctcatgcggttcacgaccagacagcggcccgcgtgct
gccccggaagtctatcggtgtgcgacgccggagtgggcggggagccgggacagcagccaccctcgctgcctgatccagaactt
catgctgaggacatctcgtgcagtggtcgcacaaaggggtgcagctccggagcccccggcacagcagcagcagccccgc
aagacaaagggtccggctcttcgtcttcagccgcttgagggtgaccagggccgaatggggagcagaagaatgattcatctgcgc
gtgcagttccatgagcgagcgagcccccctcacagacctccagcagcggtgctgtgtaaatcccggtgtaaatgataatctagaa

Amino acid sequence:

20 SNPRGVSA YLSRPSFDFLIRKSPITITCLVVDLAPSKGTVNLWTSRASGKPVNHSTR
KEEKQRNGTLTVSTLPVGTTRDWIEGETYQCRVTHPHLPRALMRSTTKTSGPRAA
PEVYAFATPEWPGSRDKRTLACLQNFMPEDISVQWLHNEVQLPDARHSTTPQRK
TKSGGFFVFSRLEVTRAWEQKDEFICRAVHEAASPSQTVQRAVSNPNKG

6. **hIgG1H/IgE WCH3 WCH4**

Nucleotide sequence:

25 tgaatcaggagcccaatctctgacaaaactcacatccccacgctcccgatccaacccgagaggggtgagcgccatccta
agccggcccagcccgctgacactgttcatccgaaagtcgccacgatcacctgtctgtgtggtgacclggcaccgcaagggtg
accgtgaacctgacctgtgtccggggcagtgaggagccctgtgaaccactccaccagaaaggagagagacagcgcaatggca
cgttaacctcagctcagctccactccgggtggcaccggagactgagtgagggggagactaccagtgcagggtgacctacccc
30 cactcggcagggccctcatgcggtccacgaccaagaccagcgcccccgtgctgcctccggagagctatgcgttggcagcgc
ggagtggcggggagacccgggacaagcgcaacctcgccctgctgatccgaactcatgctgaggagactatcgtgtgcagtggt
gcacaacgaggtgcagctccggagccggcgacagcagcagcagccccgaagaccagggtccggctctctgtcttca
35 ggcgcttgagggtgaccagggccgaatgggagcagaagaatgagttcatctgccgtgcagttccatgagcgagcagcgccctca
cagacctgcagcgagcgtgtctgtaaatcccggtgtaaatgataatctagaa

Amino acid sequence:

35 DQEPKSSDKTHTSPSPASNPGRVSA YLSRPSFDFLIRKSPITITCLVVDLAPSKGTV
NLWTSRASGKPVNHSTRKEEKQRNGTLTVSTLPVGTTRDWIEGETYQCRVTHPHL
PRALMRSTTKTSGPRAAPEVYAFATPEWPGSRDKRTLACLQNFMPEDISVQWLH
NEVQLPDARHSTTPQRKTKSGGFFVFSRLEVTRAWEQKDEFICRAVHEAASPSQ
40 TVQRAVSNPNKG

7. **IgE WCH2 WCH3 WCH4**

Nucleotide sequence:

Tgatcactgtctccagggacttcccccggccaccgtgaagattctacgtctcctgcagcggcggggacactcccccg
accactagctcctctgtctcgtctgtgggtacccccagggactatcaatcaccttgctgaggagcggcgaggtcatggacg
45 tgcactgttccacgcgctctaccacagcaggaggtgagctggcctccacaaaagcgagctcaccctcagcagaagactggc
tgtcagacccgacctacacctgccaggtcacctatcaaggctcacactttgaggacagcaccagaaggtgtgcagattcaaccc
gagaggggtgagcgccacttaataagccggccagcccgttgcactgttcatccgaagtcgccaccgatcacctgtctgtgtgtg
gacctggcacccagaaggggacctggaacctgacctgtgccggggccagtgaggagcctgtgaaccaactccaccagaaagg
50 agggagagcagcggcaatggcactgaacgtcagctccacctgocggtggggaccaccgagactggatcagggggagacctta
ccaagtgaagggtgacccacccccacctgccagggccctcatgcgtgcacagaccagaccagggcccccgtgtgtgcccc
gaaagtcatgcgttgcgacgcccgggtggccggggagccgggacacccgctgcctgcatcagaactcatgcct

WO 2005/017148

PCT/US2003/041600

gaggacatctcggtgcagctgctgcacaacgaggtgcagctccccggagcccgccagcagcagcagcagccccgcaagacc
aagggtccctcggtctctctcagccgctcgaggtgaccaggccgaatgggagcagaagaatgagttcatctgccgtgcag
tccatgagcagcagccctcacagaccgtccagcgggtgtctgtaaatcccggtgtaaatgataatctaga

- 5 Amino acid sequence:
DHVCSRDFTPPTVKILQSSCDGGGHPPTIQLLCLVSGYTPGTINTWLEDGQVMDV
DLSTASTTQEGELASTQSELTLQKHWSLDRTYTCQVTYQGHTFEDSTKKCADSN
PRGVSAYLSRSPFDFLIRKSPITITCLVVDLAPSKGTVNLTSRASGKPVNHSRKE
EKQRNGTLTVTSTLPVGTTRDWIEGETYQCRVTHPHLPRALMRSTTKTSGPRAAPE
10 VYAFATPEWPGSRDKRTLACLQNFMPEDISVQWLHNEVQLPDARHSTTPRKTK
GSGFFVFSRLEVTRAWEWEQKDEFICRAVHEAASPSQTVQRAVSVNPGK

8. hIgG1H/IgE CH3 CH4 (ORF)

Nucleotide sequence:

- 15 tgatcaggagcccaaatctctgcacaaactcacacatccccaccgtccccagcatccaacccgagagggggtgagcgccaccta
agccggccagcccgcttcgactgtttcatccgcaagtcgcccagatcacctgtctgggtggtgacctggccaccagcaagggg
accgtgaacctgacctgtccctccggccagctgggaagcctgtgaaccactccacagaagaaggaggaagcagcagcgaatggca
cgttaaccgtcacgtccacccctcgctggggcaccggagactgcatcgagggggagacctaccagtgaggggtgacccacccc
cactctgcccagggccctatgcgggtccagaccaagaccagcgcccgctgctgctccccgggaagtctatgcgtttgcagcc
20 gggagtggccggggagccgggacaagcgacccctgcctgctgatccagaactctcatgagcagacatctcggtgcagtggtct
gcacaacgaggtgcagctccccgacgcccggccacagcagcagcagcagcccccgaagcaaggggtccggtctctcgtcttca
gcgcctcgaggtgacaggccgaatgggagcagaagaatgagttcatctgcccgtgcagtcctatgagggcagcagccctca
cagccgtccagcgagcggtgtctgtaaatccgggtaaagggtatctctgga

- 25 Amino acid sequence:
DQEPKSSDKTHTSPSPASNPRGVSAYLSRSPFDFLIRKSPITITCLVVDLAPSKGTV
NLTWSRASGKPVNHSRKEEKQRNGTLTVTSTLPVGTTRDWIEGETYQCRVTHPHL
PRALMRSTTKTSGPRAAPEVYAFATPEWPGSRDKRTLACLQNFMPEDISVQWLH
NEVQLPDARHSTTPRKTKSGSFFVFSRLEVTRAWEWEQKDEFICRAVHEAASPSQT
30 VQRAVSVNPGKSGSFE

9. 2H7 VHL11S scFv hlgG1(SSS-S)H hlgE WCH3 WCH4

Nucleotide sequence:

- aagcttgcgcccatgatttcaagtcagatttcagcttctctgaatcagtgcttcatgctataattgccagaggacaaattgttctct
35 cccagctcccaacaaatctgtctgcatctccagggaaggtgcacaatgactgcaggcccgactcaagtgtaagttaatgact
ggtaaccagcagaagcaggaatctctcccccacacccctggattatgccccatcaacctggctcttgaggtccctgctcgttcagtg
gcagtggtctgtgggaccttactctctcacaatcagcagagtgaggctgaagatgctgccacttattactgccagcagtggaattt
taaccaccaccagcttgcgtgctggaccagaagctggagctgaaagatggcgggtggctcggcggtgtggatctggagaggtg
ggagctctcagggattatcacagcagctctggtggctgagtcgtgagggcctggggcctcagtgaaagtgtctcgaaggctcttgcc
40 tacacatttaccagttacaattatgcactgggtaaagcagacacatagacaggccctgggaatggattggagcttattacagcagtgaaat
gggtataattctcacaatcagaatttcaaggccaaaggccacactgactgtagacaatactccagcagagcctacatgcagctcag
cagcctgacatctgaagactctgctggtctattctgtcgaagagtggtgactactatgtaactcttactgtaactctgctgtgggcac
agggaccacaggtcacgcgtctctctgtacagagcccaaatctctgcacaaactcacacatcccaactcctcagcatccaac
cagagagctgtgagcgctactaaaggccgcccagcccgctgcagctgttcatccgaaagtcgcccacacactcgtctgtgtgt
45 ggaactgggacccagcagaaggaccgtgaacctgacctgtgccgggccaagtggaagcctgtgaacctcaccacagcagaag
gaggagagacgcagcagtgacgttaaacgtcacgtccacccctggcgtgggaccccgagactggtatcaggggaggagacct
accagtgcagggtgagccaccccaacctgccagggccctcatcggttcacagaccagcagcagcggccggcgtgctgcccc
ggaaagtctatgctttggagcagccggagtgccggggagccgggacagcagccctgctgctgctgacacgaacttactgccc
tgaagacatctcgtggtcagtggtgcacaacgaggtgcagctccccggagcggcggcagcagcagcagcagcccccgaagacc
50 aagggtccggtctctctgctcagccgctcgaggtgaccagggccgaatgggagcagaagaatgagttcatctgcccgtgcag
tccatgaggcagcagccctcacagaccgtccagcagcggtgtctgtaaatccgggtgtaaatgataatctaga

WO 2005/017148

ECT/US2003/041600

Amino acid sequence:

MDFQVQIFSLLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSVSVMHWY
QKPKGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
5 FNPPTFGAGTKLELDKGGSGGGSGGGSSQAYLQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGNDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSYWYFDVWGTGTTVTVSSDQEPKSSDK
THTSPSSASNPRGVSAIYLRSPSPFDLFIKSPITCLVVDLAPSKGT/VNLTWSRSG
KPVNHSTRKEEKQRNGTLTVTSTLPVGTDRWIEGETYQCRVTHPHLPRALMRSTT
10 KTSGPRAAPEVYAFATPEWPWPSRDKRTLACLQNFMPEDISVQWLHNEVQLPDAR
HSTTQPRKTKGSGFFVFSRLEVTRAWEQKDEFICRAVHEAASPSQTVQRAVSVNP
GK

10. 2H7 VHL11S scFv hIgG1(SSS-PH hIgE WCH3 WCH4

Nucleotide sequence:

aagcttgccgccatggatttcagtgacagatttcagcttctgctaatacagtgcttcagtcataaattgccaggacaaattgtctct
cccagctccagcaatctctgctgcatctccaggaggagaggtcacaatgacttcgagggccagctcaagtgtaagtacatgcact
5 ggtaaccagcagaagccagagctctcccccaaacctcgattatgcccaatccaaactggcttcggagtcctctgctgcttcacg
cagctggctgctggagaccttactctctcacaatcagcagaagtgaggctgaagatgctgacacttactgcccagcagtgaggatt
20 taaccaccacccagcttcggtgctgggaccagctgagctgaagatggcggctgctcggccgctgctggatctggagaggg
ggagctctcaggcttatctacagcagctcgggctgagtcggagcctgggcccagtcagtgaaatgctctcgaaggctcttgcc
tacacattacagttacaatgatcactgggtaaagcagacacctagacaggccctggaaatgattgagctattatccaggaaat
ggtagacttctcacaatcagaagttcaaggcccaaggccacactgactgtagacaaatctccagcagacgctacatgcagctcag
25 cagctgcacatctgaagactctgctgctatttctgtgacaagagtgctgtactatagtaactcttaactggtactgctatgctggg
agggagacacagctgacccgtctctctgatcaggagcccaaatcttgacaaaactcacacatcccaaccgtgcccagcactcaacc
cgaagggggctgagccgctacctaagccgcccagcccgcttcgactgttaccgcaagctgccacgatcacctgtctgtggt
ggacttcggcaccagcgaaggggaccgtgaactgacctgctccgggcccagtggggaagcctgtgaaccatccacacagaag
30 gaggagagacgagcgaatggcacgtaaccgtcagctccacctgcccgtgggacccgagactggatcaggggagacat
accagtgacgggtgacccaaccccaactgcccaggccctcatgctggctccagaccaaagcagcggcccgctgctgccc
ggagctctatgctgttgcgacgccggagtgccggggagccgggacaaagcgacccctgctgctgattccagaacttcatgcc
tgaaggacatctcgggtcagtgctgcacaacgaggtgcagctccggagcccgccacagcagcagcagcagcccgcaagacc
aaggctctccgcttctctgtcttcagccgctggaggtgaccagggccgaatgggagcagaagaatgattcattgctcggctgacg
35 tccatgagcagcagagccctcacagaccgtcagcagcagcgggtgctgtgtaataccgggtaaatgataactaga

Amino acid sequence:

MDFQVQIFSLLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSVSVMHWY
QKPKGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
5 FNPPTFGAGTKLELDKGGSGGGSGGGSSQAYLQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGNDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSYWYFDVWGTGTTVTVSSDQEPKSSDK
THTSPSPASNPRGVSAIYLRSPSPFDLFIKSPITCLVVDLAPSKGT/VNLTWSRSG
KPVNHSTRKEEKQRNGTLTVTSTLPVGTDRWIEGETYQCRVTHPHLPRALMRSTT
10 KTSGPRAAPEVYAFATPEWPWPSRDKRTLACLQNFMPEDISVQWLHNEVQLPDAR
HSTTQPRKTKGSGFFVFSRLEVTRAWEQKDEFICRAVHEAASPSQTVQRAVSVNP
GK

10. 2H7 VL L106S

aagcttgccgccatggatttcagtgacagatttcagcttctgctaatacagtgcttcagtcataaattgccaggacaaattgtctct
5 cccagctccagcaatctctgctgcatctccaggaggagaggtcacaatgacttcgagggccagctcaagtgtaagtacatgcact
ggtaaccagcagaagccagagctctcccccaaacctcgattatgcccaatccaaactggcttcggagctcctgctcgttcagtg

WO 2005/017148

PCT/US2003/041600

gcagctgggctctgggacaccttactctctcacaatcagcagagtgaggctgaagatgctgccatttactgcccagcagtgaggatt
taaccacccacagcttgcgtgctggaccaagctggagctgaagatggcggctgctcggcggtggtgagctggaggaggtg
ggagctc

5 Amino acid sequence:

MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTYSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLESKDGGGSGGGSGGGSS

10 11. 2H7 VL L106S scFv

Nucleotide sequence:

aagcttgccgccatggaatttcaagtcagattttcagcttctgtaatacagtgcttcagtcataatgccagaggacaattgttctc
ccagctctccagcaatctctgctcatctccaggggagaggtcacaatgactgcaggggcagctcaagtgtaagtacatgcact
ggtaccagcagaagccagatcctccccaacccctggattatgcccatccaactggtctcggagctccctgctcgttcagtg
15 gcaatgggtctgggacaccttactctctcacaatcagcagagtgaggctgaagatgctgccatttactgcccagcagtggaatt
taaccacccacagcttgcgtgctggaccaagctggagcttaaaagtcggcgtgctcggcggtggtgagctggaggaggtg
ggagctctcagcgttatctacagctctgggctgagctggtgagggctggggcctcagtggaagatgctcgaaggctctggc
tacacatttaccagttacaatgactcagtggaagaagcagacactagacaggccctggaatggatggagctattatccaggaaat
ggtgatactctcacaatcagaagttcaaggcgaagccacactgactgtagacaatactccagcagacgctacatgcagctcag
20 cagctgacatctgaagactctgcggtctatttctgtgcaagagtggtgactatagtaacttactgtaactctcatgctctggggcac
agggaccacagctcaccgtctctctgacag

Amino acid sequence:

MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
25 QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTYSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLESKDGGGSGGGSGGGSSQAYLQQSGAELVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSYWFYD VWGTGTTVTVSSDQ

30 12. 2H7 scFv VL L106S VHL11S scFv

Nucleotide sequence:

Aagcttgccgccatggaatttcaagtcagattttcagcttctgtaatacagtgcttcagtcataatgccagaggacaattgttctc
tccagctctccagcaatctctgctcatctccaggggagaggtcacaatgactgcaggggcagctcaagtgtaagtacatgcac
tggtaaccagcagaagccaggtatcctccccaacccctggattatgcccatccaactggctctcggagctccctgctcgttcagt
35 ggcagtggtgctgggacaccttactctctcacaatcagcagagtgaggctgaagatgctgccatttactgccagcagtggaat
tttaaccacccacagcttgcgtgctggaccaagctggagcttaaaagatggcgtgctcggcggtggtgagctggaggaggt
ggagctctcagcgttatctacagcagctgggctgagctggtgagggctggggcctcagtggaagatgctcgaagctctgcaagctctg
gctacacatttaccagttacaatgactcagtggaagaagcagacactagacaggccctggaatggatggagctattatccaggaa
atggtgatactctcacaatcagaagttcaaggcgaagccacactgactgtagacaatactccagcagacgctacatgcagctc
40 agcagctgacatctgaagactctgcggtctatttctgtgcaagagtggtgactatagtaacttactgtaactctcatgctctggggc
acagggaccacagctcaccgtctctctgacag

Amino acid sequence:

MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
45 QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTYSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLESKDGGGSGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSYWFYD VWGTGTTVTVSSDQ

50 10. Human IgD hinge linker with attached restriction sites

Nucleotide:

WO 2005/017148

PCT/US2003/041600

gttgatccagggttcgaagcttccaagggcagggcctctccgtgccactgcacaaccccagcagagggcgagcctgccaa
ggcaaccacagccccagccaccctgaacacaggaagagagagaagaagaagaagagagaagagaagagaga
caagaagagagagagacaagaaccgggtgcagtcgacg

- 5 Amino acid:
VDPGSKSPKAQASSVPTAQPQAEGLAKATTAPATTRNTGRGGEEKKKEKEKEEQ
EERETKTGAVD

Sequence of Native IgD hinge domain:

- 10 (includes a cysteine residue—we truncated the hinge prior to that residue for these
constructs:)

Nucleotide:

- gagttctcaagggcagggcctctctcgtgccactgcacaacccccagcagagggcgagcctgccaaaggcaaccacagccc
cagccaccacccgtaacacaggaagagggagagagagaagaagaaggaaggaaggaaggaaggaaggaaggaagga
15 gacaagaacaccagaggtgtccgagccacaccagcctcttggcgtctacctgtaacacct

Amino acid sequence:

ESPKAQASSVPTAQPQAEGLAKATTAPATTRNTGRGGEEKKKEKEKEEQEERET
KTPECPHSHTQLPGVYLLTP

- 20

12. 2H7 VH L11S

Nucleotide sequence:

- gaggcttatctacagcagctctggggctgagtcggtgaggcctggggcctcagtgaaagatctctgcaaggctcttgctcacacattt
accagttacaattatgcacatgggtaagacagacacctagacagggcctggaatggattggagctattatccaggaatgggtgatact
25 tctacaatcagaaagtccaaggcgaaggccacactgactgtagacaatatctccagcacagcctacatgcagctcagcagcctga
catctgaaagactctgggctctattctgtgcaagagtggtgtactatagtaactcttactggtaactgatgtctggggcacagggacc
aaggctcaccgtctctct

Amino acid sequence:

- 30 QAYLQQSGAESVRPGASVKMSCKASGYTFTSYNMHWVKQTPRQGLEWIGATYPG
NGDTSYNQKFKGKAILTVDKSSSTAYMQLSSLTSEDSAVYFCARVYVYSNSYWY
FDVWGTGTTVTVSS

13. 2H7 VH L11S scFv

- 35 Nucleotide sequence:

- aagcttgcgcgaatgatttcaagtcagatfttcagcttctgctaatacagtgcttcagtcataatgccagaggacaaattgtctct
cccagttccagcaatcctgtctgcatctccaggggaagaggtcacaatgacttcagggccagctcaagtgtaagttacatgcact
ggtlacacagagaagccaggaatcctcccccaaccctggattatgccccatcaaacctggtctctggagtcctgtcgtctcagtg
gcagtggtgcttgggacctctactctctacatacagacagatggaggtctgaagatgctgccacttatctccagcagcagtggaatt
40 taaccacacacggttcgggtgctgggaccaagctggagctgaaagatggcgggtgctcggcggtgtggtgctgagtgagagaggtg
ggagctctcaggttatctacagcagctctgggctgagtcggtgagggcctggggcctcagtgaaagatgtctcgaaggcttctggtc
tacctatccaggttacaattgcactgggtaagcagacacctagacaggcctggaatgattggagctattatccaggaat
ggtgatattctctacaaatcagaagtcgaaggcagggccacactgactgtagacaaatcctccagcagcagctcatatgcagctcag
cagctcagcactggaagactctgggctctattctgtgcaagagtggtgtactatagtaactcttactggtactctgatgtctggggcac
45 agggaccacggctcaccgtctctctgacag

Amino acid sequence:

- MDFQVQLFSLISASVHARGQIVLSQSPAILSASPGEKVTMTCRASSVSVMHWY
50 QQKPGSSPKPWYAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYYCQQWS
FNPPITFGAGTKLELKDGGSGGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK

WO 2005/017148

PCT/US2003/041600

ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFVDVWGTTTVTVSSDQ

14. 2H7 scFv VH L1S hlgG1 (CSC-S)H WCH2 WCH3

5 Nucleotide sequence:
aagcttgcgccatggaatttcaagtcagattttcagcttctgctaatacagtgcttcagtcataaattgccaggagacaattgttctct
cccagctccagcaatcctgtctgcatctccaggaggagaaggtcacaatgacttcgaggccagctcaagttctaatgattacatgcact
20 ggtaccagcagaagccaggatcctccccaaacctggattatgccccatcaacctggcttcttgagtcctgtcgttcagtg
gcagtggtgtctggacctctactctctacacatcagcagagtgagggtgaagatgctgccacttattactgccagcagtggaattt
taaccaccacgtgtcgtctggaccagaagctggagctgaagaatgagcgtgctcggcggtgtggaatcggaggaggtg
ggagctctcaggcttatctacagcagctctggggtgagctgtgagcctggcgccagtgaaatgctcctgcaaggcttctggtc
acacatttaccagttacaatagcactgggtaaagcagacacctagacagggcctggaatggattgagctatttaccaggaatg
15 gtgatactctcaatcagaagttcaaggcgaagccacactgactgtagacaatctccagcacagcctactgcagctcagc
agcctgacatctggaagactctgcgtctattctgtgcaagagtggtgtactatgtaactcttactgttactctgaatcttgaggcaca
gggaccacggctaccgltctctgtatcaggagccaaatctgtgacaaactcacatctccacgtgctcagcactggaactc
ctgggtggagcgtcagcttctcttcccccaaaacccaaggacacacctcatgctccggagccctgaggtgcacatgctgtggt
20 ggtggcgtgagccagcagacacctgaggtcaagttcaactggtagcgtgacgcgglggaggtgcataatgccagacaagaac
cgcggggaggagcagtcacacagcagctaccgtgtgttcagcgtctcaccgctcctgcaccagagctggctgaatgccaaggag
tacaagtgcaaggtctccacaagaagccctccagccccatcgagaanaaatctccaaagccaaggcagccccggaacc
25 taaaggtgtacactgcgcccccattccggatgagctgaccaaagacagctcagctgacctgcctgtcacaaggtctctatcca
agcgacatcgccgtggaatgggagagcaatgggcagccggagaacaactacaagacacgcctcccgctgctggactccgacg
gtctcttctctctacagaagctaccggtgacaaagcaggtggcagcagggagacgtcttctatgctcgtgatcatgag
30 gctgtcacaacctacacaggaaggcctctcctgtctccgggtgaatgatctaga

25 Amino acid sequence:
MDFQVQIFSLISASVUIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QKQPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQWS
30 FNPPTFGAGTKLELKGDDGGSGGGSGGGSSQAYLQQSGAESVRPAGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFVDVWGTTTVTVSSDQEPKSCDK
35 THTSPPCSAPBLLGGPSVFLFPPKPKDITLMISRTPEVTCVVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVWESNGQPE
NNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNNHYYTQKSLSL
SPGK

15. 2H7 scFv VH L1S IgE WCH2 WCH3 WCH4

Nucleotide sequence:
aagcttgcgccatggaatttcaagtcagattttcagcttctgctaatacagtgcttcagtcataaattgccaggagacaattgttctct
40 cccagctccagcaatcctgtctgcatctccaggaggagaaggtcacaatgacttcagggccagctcaagtgtaagtacatgcact
ggtaccagcagaagccaggatcctccccaaacctggattatgccccatcaacctggtctcttgagtcctgtcgttcagtg
gcagtggtgtctggacctctactctctacacatcagcagagtgagggtgaagatgctgccacttattactgccagcagtggaattt
taaccaccacgtgtcgtctggaccagaagctggagctgaagaatgagcgtgctcggcggtgtggaatcggaggaggtg
ggagctctcaggcttatctacagcagctctggggtgagctgtgagcctggcgccagtgaaatgctcctgcaaggcttctggtc
45 acacatttaccagttacaatagcactgggtgaagcagacacctagacagggcctggaatggattgagctatttaccaggaatg
gtgatactctcaatcagaagttcaaggcgaagccacactgactgtagacaatctccagcacagcctactgcagctcagc
agcctgacatctgaagactctgcgtctattctgtgcaagagtggtgtactatagtaactcttactgtactctgactgtctggcaca
gggacacgggtcaccgtctcttctgacacgtctgtctccagggtactcccccggccacccgtgaaatgacttactgtcgtcgcac
50 ggcgggggacctccccgaccatcagctcctgtgctcgtctgtctgttggttacccccagggtactacaatcaccctgctgg
aggagggcgaaggtcatgagctgagctgtctcaccgctctaccagcgaaggaggtgagctggcctccacaagaagcagctc
acctcagcagaagcactggtctgacagccgacactacacctgccaggtcactatcaaggtcacacctttgaggacagacca

WO 2005/017148

PT/US2003/041600

agaagtgctgacgattcaacccgagaggggctgagcgctacctaagccggcccaagcccgctgacgtgtcatccgcaagctgc
ccacgatacactgtctgtgtgacctggcaccagcaaggggaccgtgaacctgacctgtgtcccgccagctgtggagacgt
gtgaacacacacacaggaagggaggaagcagcgcaatggcagctgaacctgacgtccacactgtccggtgggcaaccgag
actggatcgagggggagacacacagctgacgggtgaccacccccacctgccaggccctcatgctgggtccagcaacagac
cagcgcccccgtgtgtcccccgaagctctatgctgttgacgacccgagtgctgggggagccggcagcaagcgaacctgtcc
tgctgtgacagaaacttactgctgaggaacatctgtgtcagtggtgctgcacaacgaggtgcagctcccggaacccggcagac
acgacgcagcccccagagcaacagggtctcgtctctgtcttcagcccgctgagagtgaccagggcggaatgggagcagaa
agatgagttcatctgcccgtcagtcacatgagcgacgagccccacagaccgtccagcgagcggtgtctgtaaatcccggtaaa
tgataatctaga

10 Amino acid sequence:
MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYYCQQWS
FNPTTFGAGTKLELKDGGSGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK
15 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSDSASVYFCARVYYNSNYWYFDVWGTGTTVTVDHVCSDFT
PPTYKTLQSSCDGGGHFFPTIQLLCLVSGYTPGTINITWLEDGGVMDVLSATSTQ
EGELASTQSELILSQKHWSLDRITYTCQVITYQGHTFEDSTKKCADSNPRGVSAYLS
RPSFDFLRKSPITLCLVVDLAPSKGTVNLTWSRASGKPNVHSTRKEEKQRNRLTL
20 VISTLPVGTDRWIEGETYQCRVTHPLPRALMRSTTKTSGPRAAPEVYKATPEW
PGSRDKRTLACLQNFMPEDISVQWLHNEVQLPDARHSTTPRKTKGSGFFVFSRL
EVTRAWEWQKDEFICRAVHEAASPSQTVQRAVSVPNGK

16. 2H7 scFv VH L1S mlgE WCH2 WCH3 WCH4

25 Nucleotide sequence:
aagcttgcggccatgagatttcaagtgacagatttcaagcttctgctaatcagtgcttcagtcataatgtccagaggacaattgtctct
cccagcttccagcaactctgtctgacttccaggggagaaagtgacacaaactgacttgcaggccagctcaagtgtaagttacatgcaact
ggtagcagcagaagccaggaactcccccaaccctggalltatgcccacacacacactggctgtgaggtccctgtcgtctcagtg
gcagtggtgtctgggaccttactctctcacaatcagcagngtgtaggctgaagatgctgccacttattacgacagctgtgagatt
30 taaccacccacagcttctgtgtctgggacaaagctggagctgaagatggcgggtgctcggcggtgtgtggaactggaggggtg
ggagctctcagcgttattatcacagcagcttggggctgagctgtgagggcctgggacctgaggaatgctctcgaaggcttctgct
acacattaccagttacaatattgacttgggtaaacgacacactagacaggcgctggaatggatggagctattatccaggaatg
gtgatacttctacaatcagaagtgtaagggaagccacactgactgtagacaatactccacagcagcctacatgacagctcagc
agcctgacatctgaagactctggctctatttctgtgcaagagtggtgtactatagtaactcttactgctacitcgaatgtctgggca
35 gggaaccagggtagcgtctcttctgacacgttgcacctgtcaacatactgagccacccttgagactactcattactctgcgacc
ccaatgcattcacctccacacacagctgactgtcttattatggccacatctaaatgatgtctctctgacgtgctgaatgagcagc
gggagataactgatacactgtcacaaactgttctaatcaaggaggaaggcnaactagcctctacctcagtaaacctacaactcag
agcagcaatggatgtctgaaagacaccttcacctgcaagggtcacctccccaggcgtagactatttggcccaacacitgggagatgccca
gaatcagggcacgggtgtgattactactctgatccaccagccccctggacctgtataaacagggtgtctcccaagcttactgt
40 ctgtgtgtggactgtgaagagcagaagaatgtcaatgtgacgtggaaaccaagaggaagactcagctcagactacccagatccca
acactaagcaccacataaacgccacaactagtatcaccttccatctcgtctgtatgttggccaaggactgtatgaaggctacgctatc
agtgcatagtggaccacccctgalltccaagccattgtgtgttccatcacaagccccagggcagcgctcagccccgaggtat
tatgtgttccaccacacagagggagagagagcaggacaaacgcacatccactgtttgatccagaactcttccctgaggatattct
gtgcagtggctggggatggcaactgatctcaaacagccaacagataccacaacacccctgaaatccaatgtctccaatcaa
45 ggtcttcttacttctcagtcgctgtaggtgcgcaagacactctggacacagaaaacagcttcccaatgtagtacctgagcag
actcagaataccaggaactggagaaaacaatatcacagaagcctgtgtaacacccctccctgcctcatctagatctagaag

50 Amino acid sequence:
MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYYCQQWS
FNPTTFGAGTKLELKDGGSGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK

WO 2005/017148

PT/US2003/041600

ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPGNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSDSAVYFCARVYVYSNSYWFYEDVWGTGTTVTSSDHRVPNIT
EPTLELLHSSCDPNAFHSTIQLYCFYGHILNDVSVSWLMDREITDTLAQTVLKE
EGKLASTCSKLNITEQQWMSESTFTCKVTSQGVLYLAHTRRCPDHEPRGVITYLIP
5 PSLDLYQNGAPKLTCLVVDLESEKNVNVNTWQEKKTSVSASQWYTKHHNNATT
SITSILPVVAKDWIEGYGYQCIVDHPDFPKPIVRSITKTPGQRSAPFVYVFPPEESEE
DKRTLCLIQNFPEDISVQWLGDKGLISNSQHSSTTPCLKSNGSNQGFIFSRLEVAK
TLWTQRKQFTCQVIHEALQKPRKLEKTISTSLGNTSLRPS

10 17. 2H7 scFv V H1 L1S hIgA WH WCH2 T4CH3

Nucleotide sequence:

aaagcttgccgcacatggaatttcaagtgcaagatttcaagcttctgctaatacagtgcttcagtcataattgccagaggacaaattgttctct
cccagcttcacgaatctgtctgcatctccaggggagaaggtcacatgactgcaggggccagctcaagtglaagttacatgcact
ggtagacagcagangcagagctctcccccacccctggaattatgcccatccacactggtctdggagtccctgtctgcttcagtg
15 gcaptgggtctgggaccttactctctcaacaatcagcagagtgaggagctgaagatgctgccatttactgccagcagtggaatt
taaccacccacagcttgcgtgctggaccacagctggagctgaagatggcggtgctcggcggtggtgctgagtcggaggagtg
ggagctctcagcgttactacagcagctcgggctgagctctggagcctgggctcagtggaagatgctcagaggctctgctgct
acacattaccagttacaatagcactgggtaaaagcagacacctagacagggcctggaatggatggagctattatccaggaaatg
gtgatactctcaacaatcagaatgtaagggaagggccacactgactgtagacaatctccagcagacccatcatcagcagctcagc
20 agcctgacatctgaagactcggctctattctgtagaagtggtgtagtatactgtaactcttactgtagcttgcgtgctgggacac
gggacacaggtcaccgtctcttctgatacagcagctccctcaactccacactcccatctcctcactccactccaccccatctcct
catgctgcccaccccgaactgcaatgcacggccctcaggacactgctcttaggttcagaaagcagtcacactgcagctgcacactg
accggcctgagagatgctcagctgctcaacttcaactggaacccctcaagtggaagagcgtggttcaggacacactgacccgtg
acctctgtgctgctacagctgctcagctgctcgcggctgtgcccagccatggaacacatgggaacacctcactgcaactgct
25 gctccaccccgaatccaaagacccgctaaccgccacccctctcaaaatccggaacacatctcgcccgaaggttcacactgctgcg
ccgctcgtggaggagctggccctgaacgagctggtgacgctgacgtgacctggcacggtgctcagccccaagatgctgctggt
cgtgctgctgaaggctcagcagagctgccccgcgagaaatgactgactgggcatcccgccagcagcccaacagcagggcaca
ccacctcgtgctgacagcagcactgctgctggcagccgagactgggaagaaggggacacctcttctgcatggtgggcccag
aggccctgcccgtgacctcacagaaacacacgacccgtggcggtgaaacccacatgtaatgctgctgctgcatggcg
30 gagggtggaatgataatctaga

Amino acid sequence:

MDFQVQIFSLFLLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSVSVMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSSYSLTSRVEAEDAATYQCQWS
35 FNPPTFGAGTKLELKDGGSGSGGGSGGGSSQAYLQQSAGESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPGNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSDSAVYFCARVYVYSNSYWFYEDVWGTGTTVTSSDQVPVSPPT
PSPSTPTTSPSCCHPRLSLHRPALEDLLLGSEAILTCLTGLRDASGVFTFTWTPSSG
KSAVQGPDRDLDCGYSVSSVLPGAEPWNHGKTFCTTAAVYPSKTPLTATLSKS
40 GNTFRPEVHLLPPPSEELALNELVTLTCLARGSPKDVLRWLQGSQELPREKLYLT
WASRQEPSQGTTFITAVTSILRVAEDWKKGDTFCMVGHEALPLAFTQKTDRLA
GKPTHVNSVVMMAEVD

45 18. 2H7 scFv V H1 L1S mIgA WH WCH2 T4 CH3

Nucleotide sequence:

aaagcttgccgcatggaatttcaagtgcaagatttcaagcttctgctaatacagtgcttcagtcataattgccagaggacaaattgttctct
cccagcttcacgaatctgtctgcatctccaggggagaaggtcacatgactgcaggggccagctcaagtgtaagttacatgcact
ggtagacagcagaaagcagctctcccccacccctggaattatgcccatccacactggtcttctggagtccctgtctgcttcagtg
50 gcaptgggtctgggaccttactctctcaacaatcagcagagtgaggagctgaagatgctgccatttactgccagcagtggaatt
taaccacccacagcttgcgtgctggaccacagctggagctgaagatggcggtgctcggcggtggtgctgagtcggaggagtg
ggagctctcagcgttactacagcagctcgggctgagctgtagcgtgggctcagtggaagatgctcagagctctgctgct

WO 2005/017148

PCT/US2003/041600

acacattaccaggttacaataatgactgggtaagcagacacctagacaggcgctggaatggatggagctatttaccaggaaatg
gtgatactctcacaatcagaaggtcaaaggcagccacactgactgtagacaaatctccagcacagcctatcagcagctcagc
agcctgacatctgaagactctgggtctatttctgtgcaaggtggtgtactatagtaactcttactgttacttcgatgtctggggcaca
gggaccacgggtcaccgtctctctgatcacactgttctctctactactctctcaccctctgccaagccagcctgtcactgca
5 cggccagcgtcttgaggcagctgctcctgggttcagatgccagcatcacatgtactctgaatggcctgagagatcctgagggagctg
tcttaccctgggagccctcactgggaaggatgcagtcgagaagaagctgtgcagaatctcctggcgtctacagtggttccagc
gtctgcctggctgtgctgagcgtctgnaacagtggtgcacatcattcaagtgacagatgccatctctgagctgacacctaactggc
acaattgccaaagtacagtgaaacaccttccaccctcaggtccacctgtaccggcgtcggaggagctggccctgaatgag
ctcgtgctcctgacatgctggtgcgagctttcaacctaaaagaagtgtgctggcgatggcgtgcaatggaaatgaggagctgtccc
10 agaaagctacctagtgttgtagccctaaaggagccagggcagggagccacacacctacctgtgacaaagctgtgctgtgataca
gctgaaatctggaaacaggggtgaccagtaactctgcatggtggccacagggccttgcccatagaacttaccagaagaccatcg
accgtctgtggcgtaaacccaccaatgtcagcgtgtctgtgatcatgtcagaggagattgataatctagat

Amino acid sequence:

15 MDFQVQIFSLFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QKPKGSSPKPWYAPNLSAGVPARFSGSGSTSYSLTISRVEAEDAATYYCQQWS
FNPTFTAGTGLLEKLDGGSGGGSGGGSSQAYLQQSGAESVRPAGSVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTISEDASVYFCARVVYYSNSYWFYDVGWGTGTVTVSSDHKSPPTP
20 PPPSQPSLSLQRPALDLLLLGSDASITCTLNGLRDPEGAFTVWEPSTGKDAVQK
AVQNSCGCYSVSSVLPGCAERWNSGASFCKTVTHPESDTLTGITIAKVTVNTFPPQV
HLLPPSEELALNELVSLTCLVRAFPKPEVLVRWLHGNEELSPESYLVEPLKEPGE
GATTYLVTSVLRVSAEIKWQGDQYSCMVGHEALPMNFTQKLTIDRLSGKPTNVSVS
VIMSEG

A. mIgA WCH2 T4CH3

Nucleotide sequence:

Gtggatgacacatctgtctctctactactctctccacctctctgccagccagcgtgctactgcagcggcagctctgagg
ctgctctctgggttcagatgccagcatcacatgtactctgaatggcctgagagatcctgaggagcgtgtcttaccctgggagccctc
30 cactggaaaggatgcagctgcagaagaagctgtgcagaattctctggcgtgctacagtgctccagcgtctcctgcctgctgctg
agcgtctggaacagtggcgcattcaagtgacagatgccatctgagctgacaccttaactggcaaatgccaaagtacaa
gtgaacaccttccacccaggtccacctgctaccggcggcgtcggaggagctggccctgaatgagctcgtgtccctgacatgcc
tggctgcagcttcaacctaaagaagtgctgtgcgcatggcgtcagtggaatgaggagctgtccccagaagaactcactcgtgttg
agccctaaaggagcaggcgaggagccaccactacctgtgtgacaagcgtgtgctgtatcagctgaaatctggaacagg
35 gtgaccagtaactctgcatgtggggccacgaggccttgccatgaacttaccacagaagaccatcgaccgtctgtcgggtaaac
cacaatgtcagcgtgtctgtgatcatgtcagaggagattgataatctagat

Amino acid sequence:

40 DHICSPPTTPPPSQPSLSLQRPALDLLLLGSDASITCTLNGLRDPEGAFTVWEPST
GKDAVQKKAQVNSCGCYSVSSVLPGCAERWNSGASFCKTVTHPESDTLTGITIAKV
TVNTFPPQVHLLPPSEELALNELVSLTCLVRAFPKPEVLVRWLHGNEELSPESYL
VFEPLKEPGEATTYLVTSVLRVSAEIKWQGDQYSCMVGHEALPMNFTQKLTIDRL
SGKPTNVSVSVIMSEG

20. K322S CH2 region

Nucleotide sequence:

ctgaaactctgggggacgtgactcttctcttcccccaaaacccaaggacacctcatgatctcccgagccctgaggtcac
atgcgtggtgggtgacgtgagccacgaagaccctgaggtcaagttcaactgtgacgtggacggcggtggaggtgataatgccaa
gacaaagcccgaggagcagtcacaacagcagctaccgtgtgtgctagcgtctcaccgtctgacacagcagctgctggaatg
50 gcaaggagtacaagtgctcgtgtcctcaacaaagccctccagcccatcgagaaacaatctccaagaacaaa

WO 2005/017148

PCT/US2003/041600

Amino acid sequence:

PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCSVSNKALPAIEKTISKAK

5

21. K322S CH2 WCH3

Nucleotide sequence:

ccctgaactctctgggggaccgtgactgtctctctctcccccacaaagacacccctcatgatctccggaccctgaggtcac
atgcgtgtggtggacgtgagccacgaagaccctgaggtcaagttcaactgtgacgtggacggcgtggaggtgcatatgcaaa
gacaaagccgcggggagagcagtaacacgacgtaccgtgtgtgacgcgtctcaccgtctgcaccaggaactggctgaatg
cgaaggagtlacaaggtcgtcgtctccaacaaagccctccacgcccccatcgagaaaaaactctccaaagccaaaggcgagccc
cgagaacacacaggtgtacacacctgcccccatccgggatgagctgaccaagaccagggtcagcctgacctgctggctcnaagg
cttctatccacgcgacatcggcgtggaggtggagagcaatggggcagccggagacaactacaagaccacgctccgtcgtggtg
actccgacggcctcctctctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtcttctcatgctcctg
atgcatgaggtctctgcacacactacacgcagagagcctctcctctgctccgggtaaatgatctaga

15

Amino acid sequence:

PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCSVSNKALPAIEKTISKAKG
QPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPV
LDSGDSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLSLSPGK

20

1. K322L CH2 WCH3

Nucleotide sequence:

tgatcaggagcccaaatctcttgacaaaactcacacatccccaccgtctcagcacctgaaactctgggggaccgtcagcttctct
cttccccccaaaaccaaagacacccctcatgatctccggaccctgaggtcacatgcgtgtgtgtggacgtgagccacgaaga
ccctgaggtcaggttcaactgtgacgtggcggcgtggaggtgcataatgccaagacaagccgcggggagagcagcacaaca
cagctgaccgtgtgtgtcagcgtctcaccgtctcgcacacaggactggctgaatggcaaggatcaagtcctgtctccaaca
agccctccacgctccccatcgagaaaaaactctccaaagcnaaggcgacccccgagaaaccagaggtgtacacctgccccat
ccgggatgagctgaccaagaacacaggctcagcctgacctgctgctcnaaggcttctatccagcgacatcgccgtggaggtgg
agagcaatggggcagccgggagaaactacaagaccacgctcccggtcgtgactccgacggctcctcttctctcagacaagct
caccgtggacaagagcaggtggcgacaggggaacgtcttctcatgctccgtgatgatgaggtctgcacacactacacgca
gaagagcctctcctgtctccgggtaaatgatctaga

25

30

Amino acid sequence:

DQEPKSSDKTHTSPSSAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHED
PEVKFNWYVDGVEVHNAAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCLV
SNKALPAIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSGDSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHN
HYTQKLSLSLSPGK

40

22. 2H7 scFv VHL11S hIgG1 (SSS-S)H K322SCH2 WCH3

Nucleotide sequence:

aagcttgccgcctatggattttcaagtcgacatttcagcttctcgtatcagtcgttcacgtatattgccaaggacaaatgttctct
ccagcttcacgaactcgtgtcgtcctccaggaggagaggtacaaatgacttcaggggccagctcaaggtgaagttaactgact
ggtaccagcagaagccaggaactctcccccaaaccttgatttatgcccccaaacctggcttctggagtcctgctcgttcagtg
gcagtggtgtcgggaccttactctctcacaatcagcagatggaggctgaagatgctgccaatttacttaccagcagtgagttt
taaccacaccacgttcgggtgtcgggaccaagctggagctgaagaatggcgttggctcggggcgtgtgtgtatctggaggaggtg
ggagctctcaggtctatctacagcagctctggggctgagtcgggtgagcctggggcctcagtgaaatgtctcgaaggcttctggc
tacaatttaccagtatacatgactgggtanaagacacactgacagggcctggaatggattgagctatttaccaggaat
ggtgatactctacaatcagaagattcaagggaaggccaacactgactgtgacaaatcctcagcagacgactcagctcagctcag

50

WO 2005/017148

PT/US2003/041600

cagcctgacatctgaagactctgcggtctattctgtcgaagagtggtgtactatagtaactcttactggtactctgatgtctggggcac
aggggacacagcgtgacacgtctctctctcccccaaaacccaaggaacacccatcatgaltccggaccctgaggtacatgcgtgg
ctggggggacgcgtgactctctctcccccaaaacccaaggaacacccatcatgaltccggaccctgaggtacatgcgtgg
tgggtgacgtgagccacgaagaccctgaggtcaagtcaactgtgacgtgacggcggtggaggtgcaatgccaagacaagc
cgcggggagagcaggtacaaacagcagctaccgtgtggtcagcgtctcaccgtctcaccaggactggctgaatggcgaaggag
tacaagtgctcgtgtcccaaaaagccctccacgccccatcgagaaaacaaatctcctcgaagcgaagggcagccccgagaacca
caggtgtacacccctgccccatcccggtgagctgaccaagaacacaggtgacgctgacgtgacctgctgcaaaagctcttaccga
ggacacgtccgtggtgagggagcaatgggacggcgggaacaaactcaagacacgcccctccgtctggtacgtgacgg
ctctctctctctacagcaagctcaccgtggacagaagcaggtggcagcaggggaacgtctctcatgctccgtgatgcgatgagg
ctctgcacaacactacacgcagaagagcctctcctgtctccgggtaaatgatctaga

Amino acid sequence:

MDFQVQIFSLLISASVIIARGQIVLSQSPAILASAPGKEKVTMTCRASSSVSYMHWY
QOKPGSSPKPWYIAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYYCQQWS
FNPTTFGAGTKLELKDGGGSGGGSGGGSSQAYLQSQGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGNDTSYNQKFKGATLTVDKSSS
TAYMQLSLSTSDSAVYFCARVYYNSYWFYDVGWGTGTTVTSSDEPKSSDK
THTSPSSAPPELLGPGSVFLFPPKPKDILMISRTPEVTCVVVDVSHEDPEVKFNWYV
DGVVEHNAKTKPREEYQYNSTRYVSVLTVLHQDWLNGKEYKCSVSNKALPAPIE
KTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNPQEN
NYKTTTPVLDSGFFLYSKLTVDKSRWQQGNVFCSSVMHEALHNHYTQKSLSLS
PGK

23. 2H7 seFv VHL11S hIgG1 (SSS-S)H K322L.CH2 WCH3

Nucleotide sequence:

aagctgcccgcattgatttcaagtcgacgattttcagctctctgtaactcagtgcttcagtcataatgagcaggacaaattgtctct
ccagctgtccagcaactctctgtcgtctccaggggagaaagtcagactgacgtgcagggccacgcaaggtgaatgatactgacact
gttacacagcagaagccagatcctcccccaaacctggattatgccccatcaacatggtcttggatcctctgctgcttcagtg
gcagtggtctggtgacctcttactctctcaaatcagcagagtggaagctgaagatgctgccattattatgccagcagtggaattt
taaccacccacgtgttcgtctgggaccaagctggagctgaaagatggcggfgtcgtggcggtgtgtgactgtggagggagtg
ggagctctcagccttatctacagcagctcggggtgagtcgggtgagcctggggcctcagtgagaatgtctctcnaagctctggc
tacacattaccagttacaatgatcagctgggttaaagcagacactagacagggcctggaagtggagtgagctattatccaggaat
ggtgalacttctcacaacagagttcaaggcgaaggccacactgactgtagacaatactccagcacagcctcatcagcgtcag
cagcctgacatctgaagactctcgggtctattctgtcgaagagtggtgtactatagtaactcttactggtactctgatgtctggggcac
aggggaccacggtcacctgtctctctgatcaggacccaatctctgacaaaactcacacatccccaccgtctcagcacctgaact
ctggggggaccgtcagctctctcctcccccaaaacccaaggaacacccatcatgaltccggaccctgaggtacatgctggtg
tgggtgacgtgagccacgaagaccctgaggtcaagltcaactgtgacgtgagcggcggtggaggtgcaatgccaagacaagc
cgcggggagagcgtacaacacagcagctacgtgtggtgacgctcctcagctcgtcaccaggactggctgaatggcgaaggag
tacaagtgctggtctctcaaaaagccctccagccccatcgagaaaacaaatctcgaagcgaagcgaagcggcggcgaacaca
caggtgtacacccctgccccatcccggtgagctgaccaagaacacaggtgacgtgacgtgctggtcgaaggtcttaccga
ggcagacatgcgtggagtgaggagcaatgggcagcgggagaacaaactcaagaccacgctccgtgctggtgacgtcagcagc
ctctctctctctcagcagaactcaccgtggacaagagcaggtggcagcgggggaacgtctctcatgctccgtgatgcgatgagg
ctctgcacaacactacacgcagaagagcctctcctgtctccgggtaaatgatctaga

Amino acid sequence:

MDFQVQIFSLLISASVIIARGQIVLSQSPAILASAPGKEKVTMTCRASSSVSYMHWY
QOKPGSSPKPWYIAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYYCQQWS
FNPTTFGAGTKLELKDGGGSGGGSGGGSSQAYLQSQGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGNDTSYNQKFKGATLTVDKSSS
TAYMQLSLSTSDSAVYFCARVYYNSYWFYDVGWGTGTTVTSSDEPKSSDK

WO 2005/017148

PT/US2003/041600

THTSPSSAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV
DGVVEVHNNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCLVSNKALPAPIE
KITISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCFSVMHEALHNHYTQKSLSLS

5 PGK

24. 2H7 scFv VHL11S hIgG1 (CSS-S)H K322SCH2 WCH3

Nucleotide sequence:

aagcttgccgccatggaattcaagtgacagatttcagcttcctgctaatactgcttcagtcataattgccagaggacaattgttctt
cccagcttcctcagcaatctgtctgcatctccaggggagaaggcacaatgactgcagggccagctcaagtgaattacatgcaat
10 ggtaccagcagaaagccagatctcccccacaacctggaattatgcccatcaacctgctcttgagctcctgctcgttcagtg
gcagtgggcttgaggcctcttactcttcacataagcagagtgaggctgaagatgctgccatttactgccagcagtgagggtt
taacccacccagcttggtgctgggaccaaagctgagctgaagatggcgggctggcggtgctggatctggaggaggtg
ggagctctcaggcttatctacagcagcttggggctgagctgggagccctggggcctcagtggaagatgctcgaaggctctggc
15 tacacattaccagttacaatgatcactgggtaaaagcagacacctagacaggcctggaatgagtgagctatttaccaggaat
ggtgatactctcacaatcagaagttcaaggccaaaggccacactgactgtagacaaatctccagcacagcctacatgcagctcag
cagctgacatctgaagactctggctctatttctgtgcaagagtgctgtaactatgtaactcttactgtgctctgagctctggggc
agggacacagcgtgaccgctctctctgatcagggacccaaactctgtgacaaaactcacatccccaccgctctcagcactcgaat
cctggggggagccgtcagcttctctctcccccaaaacccaaggacacctcatgatctccggaccctgagctcactatgcgtgg
20 tgggtgacgtgagccacgaagacctgaggtcaagttcaactggtacgtggagcggcgtgaggtgcataatgccagacaaagg
cgcgggagagcagttacacagcagcgtacgtgtgtgacagctcctcaccgctcaccagagagctgctgaatggcgaaggag
tacaagtgctcgtgtcccaaaagccctccagccccatcgagaaaacaaactccaaagccaaaggcagccccgagaacca
caggtgtacacctgcccccatccgggatgagctgaccaaagaccaggtcagcctgacctgctggtcgaaggctcttatccca
cgcgaatcggcgtggagtgaggagcaaatggcgagccgggagaaactaacaaagaccagcctccgtgctgagctccgaggg
25 cctcttctctctacagcaagctaccgtggacaagagcagcaggtggcagcagggagcgtctctctcatgctccgtgatgatagg
ctctcgaacacctacacagcagaagagcctctcctgctccgggtaattgatcaga

Amino acid sequence:

MDFQVQIFSLLISASVIIARGQIVLSQSPAILASASPGKEVTMTCRASSSVSYMHWY
30 QKQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPTFGAGTKLELKDGGSGGGGGSGGSSQAYLQQSQAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPGNGDTSYNQKFGTKVATLTVDKSSS
TAYMQLSSLSEDSASVYFCARVYYYSNSYWFYFDVWGTGTTTGVTVSSDQEPKSCDK
THTSPSSAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV
35 DGVVEVHNNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCVSNKALPAPIE
KITISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCFSVMHEALHNHYTQKSLSLS
PGK

40 25. P331S CH2

Nucleotide sequence:

cctgaactctgggggagcgtcagctctctctcccccaaaacccaaggacacctcatgatctccggaccctcagggtcac
atgctggtggtggagctggagccacgaagacctgaggtcaagttcaactgtacgtggacggcgtgagggtgcaatgccaa
45 gacaaagccgcgggagcagcagttacaaagcagcgtacgtgtggtcagcgtctcaccgctcgcaccaggaactgctgaatg
gcaaggagtagtaagtgaaggtctcccaaaagccctccacgctcctcagagaaaacaaactcaaaagcaca

Amino acid sequence

PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKITISKAK

50

26. P331S CH2 WCH3

WO 2005/017148

PCT/US2003/041600

Nucleotide sequence:

5 cctgaacctcctgggggacctgcagtcttctcttccccccaaaccgaagacacctcatgatctccgggacccctgagggtcac
atgcgtggtggtggacgtgagccacgaagacctgaggtaagtcaactgtgacgtggacggcgtggaggtgcataatgccaa
gacaagaagccggggagggagcagtaacaacgacgtaccgtgtgtgacgctctccacgtcgtgaccaggactggtgatg
gcaagggtgtacaaagtcaaggtctccaacaagccctccagcctccatcgagaanaaatctccaagccaaggcgagcc
cgagaacacagaggtgtacacctgccccatccgggatgagctgaccaagaccagggtgacctgacctgctgtctcaagg
cttctatcccgagcatcgcgtggtgagtgaggagcaatggcgagccggaggaacaactacaagaccacgctcccggtgctg
actccgacggctctctctctctacagaagctaccgtggacaagagcaggtggcgacaggggagacgtctctcatgctccgtg
atgatgaggctctgcacaaacctactacgcagaagagcctctcctgtctccgggtaaatgatctaga

Amino acid sequence

10 PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPASIEKTKSKAKG
QPREQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPV
15 LDDSGSFFLYSKLTVDKSRWQQGNVFSVSMHEALHNHYTKLSLSPGK

27. 2H7 scFv VH L11S (SSS-S)H P331S CH2 WCH3

Nucleotide sequence:

20 aaggttgcgccatgatttcaagtgcagattttagcttctctgtaatacagtgcttcagtcataattgccaggagacaattgttctct
cccagctctccagcaactctgtctgcalcccgaggagaaagtcacaatgactgcaggccagctcaagtgttaagtattacatgcact
gtgtaccagcagaagccagagctctcccccacacccctggaattatgcctccatccaactgctgtgaggtccctgtctgcttcagt
gcaatgggtctctgggaccttctactctcacaatcagcagagtggaggtgaagatgctgccattattactgccagcagtggtgatt
taaccuacccacgttctggtgctggaccaaagctggaagctgaaagatggcgggtgctcggcggtgtggtgactggagaggtg
ggngctctcaggtattatcacagcagcttggggtgagtgctgaggcctggggcctcagtgaaagatgctcgaagcctctctg
25 tacacatttaccaggttacaatatgcactgggttaagcagacactagacaggcctggaaaggattggagctatttaccaggaaal
ggtgatacttctacaatcagaagtcaaggcgcaaggccacactgactgtagacaatctccagcagacgctacatgcagctcag
cagcctgacatctgaagactctgcggtctatttctgtgcaagagtggtgtgactatagtaactcttaactggcttcgafgtctgggac
agggaccacggtcaccgtctctctctgacaggagcccaaatctctgacaaaactcacacactccaccctctcagacactgtaact
cctggggggaccgtcagcttctctctccccccaaacccaagacacacctcatgatctcccggacctctgaggtcacatgctgtg
30 tgggtgacgtgagccacgaagacctgagggtcaaggtcaactggtgactggaagcgtgtgaggtgtgataatgccagacaagc
cgcgggagggagcagctacaacgacgacgtaccgtgtgtgacgctctcaccgtctgcaccaggactggtgtaatggcaaggag
tacaagtgcagggtctccaacaaggcctccagcctccatcgagaanaaatctccaaagccaaaggcgagccccgagaacca
caggtgtacacctgccccatcccggtgatgactgaccaagaacaggtcagcctgactgctgggtcaaggctctatccca
gcgacactgcgctggtgaggtggagagcaatgggcagccggagacaactacaagaccacgctccgctgctggactcgcagcg
35 ctctctctctctacagaagctcaccgtggacaagagcaggtggcagcaggggagcgtctctctcatgctcgtgatgatgagg
ctctgcacaacctactacgcagaagagcctctcctgtctccgggtaaatgatctaga

Amino acid sequence

40 MDFQVQIFSFLIASVHIARGQIVLSQSPAILASPGKEKVTMTCRASSVSYMHWY
QQKPGSSSPKPIWYAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYVCQQWS
FNPTPTGAGTKLELKDGGGSGGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK
ASGYFTTYSNMHWVKQTPRQGLEWIGAIYPGNQDTSYNQKFKGKATLTVLTKSS
TAYMQLSSLTSEDSAVYFCARVVVYSNSYWFYFDVWGTGTTTVSSDQEPKSSDK
THTSPSPASPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV
45 DGEVEHNAAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPASIE
KTISKAKGQPREQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSVSMHEALHNHYTKLSLSPGK

28. 2H7 scFv VH L11S (CSS-S)H P331S CH2 WCH3

WO 2005/017148

PCT/US2003/041600

Nucleotide sequence:

5 aagcttgcgcgcattgattcaagtgcagattttcagcttctgctaalcagtgcttcagtcataattgccagaggacaaaattgttctct
ccagctgtccagcaatctctgtctgcaicccaggggagaaagctcacaatgactgcaggggcagctcaagtgtaagttacatgcact
ggtaaccagcagaagcggacgactcctcccaaacctcggatttatgcccatccaacctggctcttggagtcctctgctcgttcagtg
10 gcaagtggctctgggacgtctctctcacaatcagcagagtgagggtgaagatgctgccacttattatgccagcagtgaggatt
taaccacccacgttctgggtgctgggaccanctggagctgaagatggcgggtggctcggcggtggatctggaggaggtg
ggagctctcagggctatclacagcagctctggggctgagtcgggagggcctcagtggaagatgctcgcgaaggctctggc
taccactttaccagtacaatatgcactggglaagcagacacctagacaggggcctggaaatgattggagctattatccaggaaat
gggtatacttctacatcagaagttcaaggggcagggccacactgactgtagacaaatctccagcacagcctacatgcagctcag
15 cagcctgacatctgaagacgtcgggtctatttctgtgcaagagtggtgactatagtaacttactggtactcgtgctggggcag
aggcgaccggcggfaccgtctctctgtatcaggagcccaatctgtgacaaaactcacatccccacgctctcagcagcctgaact
cctggggggagcgtcagctctctctctcccccaaaacccaaaggacacctcatgatctccggaccctgagggtcacatcgtgg
tgggtggacgtgagccacgaagacccctgaggtcaagttcaactgtgactggagcggcgtggaggtgcataatggcgaagcaaaagc
cggcgggagagcagctacacagcagctaccgtgtggctcagcgtctcaccgtctgcacacaggagctgctgaatggcaaggag
20 tacaagtgcgaaggctctcaacaaagccctccagcctccatcgagaaaacaatctcaaaagccaaaggcagccccgagaacca
cagggtgtacacctgccccatcccggtgatgctgaccaagaacaggctcagcctgacctgctgctcgaagggttctatcca
ggcagatcggcgtggagtgaggagacaaatgggcagccggagaacaaclacaagacacgcctccgtgctgcacatccgcaggg
ctccttctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtctctcatgctccgtgatgatgagg
ctctgcacaaccactacagcagaagagcctctcctgtctccggtaatgatctaga

Amino acid sequence

MDFQVQIFSLLISASVVIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QKQPGSSPKPWYAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYVCQQWS
FNPTFTGAGTKLELKDGGSGGGGGSSQAYLQQSGAESVRPGASVKMSCK
25 ASGYFTSYNMHWVVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKALTIVDKSS
TAYMQLSSLTSEDSAVYFCARVYYNSNSYWFVDVWGTGTITVTVSSDQEPKSCDK
THTSPSSAPPELLGSGSVFLFPPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPASTE
KITISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
30 NYKTTTPVLVDSGSSFLYSLKLTVDKSRWQQGNVFSQSMHEALHNHYTQKSLSLS
PGK

29. T256N CH2 region

Nucleotide sequence:

35 Cctgaactctctgggggacgctcagctctctctctcccccaaaacccaaaggacacctcatgatctccggaaacctgagggtca
catcgtgtgggtggagcgtgagccacgaagacctgagggtcaagttcaactggtacgtggagcggcgtggagggtgataatgcca
agacaaagccggaggagcagctacacagcagctaccgtgtggctcagcgtctcaccgtctgcaccaggagctggcgaat
ggcgaaggagtagtaagtgcaaggtctccaacaaagccctccagcccccatcagaaaacaatctccaaagccaaa

Amino acid sequence

40 PELLGGPSVFLFPPPKPKDTLMISRNPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAIEKTISKAK

30. T256N CH2 WCH3

Nucleotide sequence:

45 cctgaactctctgggggacgctcagctctctctctcccccaaaacccaaaggacacctcatgatctccggaaacctgagggtca
atgctgtgggtggagcgtgagccacgaagacctgagggtcaagttcaactggtacgtggagcggcgtggagggtgataatgcca
agacaaagccggaggagcagctacacagcagctaccgtgtggctcagcgtctcaccgtctgcaccaggagctggcgaatg
gcaaggagtagtaagtgcaaggtctccaacaaagccctccagcccccatcagaaaacaatctccaaagccaaaggcagccc
50 cgaagaaccacaggtgtacacacctgccccatcccggatgagctgaccaagaacaggtgcagcgtgacctgctcgtgtcaaaag
cttctatccaggcgacatcgccgtggagtgaggagacaaatgggcagccggagaacaactacaagaccacgctccctgctggtg

WO 2005/017148

PT/US2003/041600

actccgacggctctcttctctctacagcaagctcaccgtggacaaagcagcaggtggcagcaggggaacgtctctcatgtctccgtg
atgcatgaggctctgcacaaacctacacgcagaaagcgtctctccctgtctccgggtaaatgatctaga

Amino acid sequence

5 PELLGGPSVFLFPPKPKDTLMISRNPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTKISKAKG
QPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPV
LDSGGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNYHTQKSLSLSPGK

10 31. 2H7 scFv VH L11S (SSS-S)H T256N CH2 WCH3

Nucleotide sequence:

aagcttgcgcgcattgatttcaagtcgagattttcagcttctctctaatacagtcgttcacgtcctaattgccagaggacaaattgttctct
ccagctctccagcaatcctgtctgtcctcaccaggaggagaggtcacaaatgacttcagggccaggtcaagtglaagtacatgcaact
15 ggtaccagcagaaagccagatctccccaaacctggattatgcccatcacaacctggtcttggagtcctctgtcgttcagtg
gcagtggtgtctgggaccttactctctcacaatcagcagagtgaggctgaagatgctgccattattaccagcagctggagattt
taaccacccacgttcgtgctgggaccaagctggagctgaagatggcggctcggcggctgggagctggagggagggtg
ggagctctcagcgttatctacagcagctcgggctgagtcgggtgaggcctggggcctcagtgaaagatgctcgaagcctctggc
tacacattaccagttacaataatgcactgggtaagcagacacactagacaggcctggaatggatggagcatttatccaggnaat
20 ggtgatacttccataacatcagaagttcaaggcgaagccacactgactgttagacaatactccagcacagcctacatgcagctcag
cagcctgacatctgaagactctgcggctctattctgtgcaagagtggtgtactatagtaactcttactggtaacttcgatgtctcgggac
agggcacacggtcacctgtcctctgtatcagcagagcccaattcttgacanaactcacacatccccacgtctcagcagctgaact
ctctgggggacgtcagctgtctctctcccccacaaacccaaggacacctatgactctccggaacctgaggtgcacatgctggtg
tgtgtgacgtgagccacgaagaccctgaggtcgaattcaactggtacgtggcagggcgtggaggtgcatatgccaagacacaaagc
25 cgcgggagcagcagctacacagcagcacgtaccgtgtggcagcgtctcaccgtctgccaccaggaactggctgaatggcgaagag
tacaagtcgaagggtctccacaagaagccctccagccctcagcagaaacaaatctccaaagcacaaggcagccccgagaacc
acaggtgtacacccctcccccactccgggatgagctgaccaagaaccagctcagcctgacctggtcgaaggtcttatatccc
agcgacatccctgtggaggtggagagcaatggcgagccgggagaacactacaagaccacgcctccctgctggagctcgaagc
gtctctcttctctacagcaagcgtcaccgtggcagaagcaggtggcagcaggggaacgtctctcatgctccgtgatgcatgag
30 gctctgcacaacactacacgcagaaagcctctctctgtctccgggtaaatgatctaga

Amino acid sequence

MDFQVQIFSLFLISASVVIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTYSYSLTISRVEAEDAATYYCQQWS
35 FNPPTFGAGTKLELKDGGSGGGSGGGSGGQAYLQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVWKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSS
TAYMQLSSLTSDSDAVYTCARVYVYNSYWFYDVGWGTGTTTVTVSSDQEPKSSDK
THTSPSSAPELLGGPSVFLFPPKPKDTLMISRNPEVTCVVVDVSHEDPEVKFNWY
VDGVEVIHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
40 EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTTPPVLDSDGGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNYHTQKSLSL
SPGK

45 32. 2H7 scFv VH L11S (CSS-S)H T256N CH2 WCH3

Nucleotide sequence:

aagcttgcgcgcattgatttcaagtcgagattttcagcttctctctaatacagtcgttcacgtcctaattgccagaggacaaattgttctct
ccagctctccagcaatcctgtctgtcctcaccaggaggagaggtcacaaatgacttcagggccaggtcaagtglaagtacatgcaact
50 ggtaccagcagaaagccagatctccccaaacctggattatgcccatcacaacctggtcttggagtcctctgtcgttcagtg
gcagtggtgtctgggaccttactctctcacaatcagcagagtgaggctgaagatgctgccattattaccagcagctggagttt
taaccacccacgttcgtgctgggaccagcgtggagctgaagatggcggctcggcggctggtggtgctggagggaggtg

WO 2005/017148

PCT/US2003/041600

ggagctctcaggcttatctacagcagctcggggctgagtcggtaggcctggggcctcagtgagaatgctctcgaagccttcggc
tacacatttaccagttacaataatgcactgggtaaacgagcacctlagacaggccctggaatggatggagctattttaccaggaat
tggtatacttctacaatcagaagttcaagggaagccacactgactgtagacaaatctccagcacagcctacatgcagctcag
cagcctgacatctgaagactctgcgtctatttctgtgcaagagtggtgactatagtaacletctactgtaacttcatgctctggggcac
agggaccacggctaccgctctcttctgtagcaggagccaaatctgtgacaaaactcacacatcccccaccgctctcagcactgtaact
5 cctggggggagccgtgactctctcttcccccaaaacccaaggacaccctcatgatctccgggaacccctgagggtcacatgcgtgg
tggtggagctgagccacgaagaccctgaggtcaagttcaactggtacgtgagccggcgtgagggtgcaataatgcgaagacaagaag
cggcgggggagcaggtacacacgacgtaccgtgtgtgtagcgtctctacccgtctcaccagcagctgctgaatgggcaaggag
tacaagtgcaaggtctcacaagaagccctccagcccccacgagaaaacaaatctccaaagcgaaggggcagcccgagaaacc
10 acaggtgtacacccctgcccccatccgggatgagctgaccaagaaccaggctcagcctgacctgcctgggtcaaggcttactacc
agcgacactgcctgtggaagtgggagagcaatgggcagccgggagaacaactacaagaccacgctcccggtgctgactccgacg
gtctcttctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtcttctcatgctccgtgatgatgag
gctctgcacaacactacagcagaagacctctccctgctctccgggtaaatgatctaga

15 Amino acid sequence
MDFQVQIFSFLISASVIIARGQIVLSQSPAILASAPGEKVTMTCRASSSVSYMHWY
QKPKGSSPKPWYIAPSNLASGVPARFSGSGSTSYSLTISRVEAEDAATYTCQQWS
FNPTPTGAGTKLELKDGGGSGGGGGGGSSQAYLQQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGNDTSYNQFKGKATLTVDKSSS
20 TAYMQLSLSTSEDSAVYFCARVYYNSNSYWFYFDVWGTGTTVTIVSSDQEPKSCDK
THTSPSPSAPPELLGGPSVFLFPPKPKDTLMISRNPEVTCVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQP
25 NNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLSL
SPGK

33. RTPE/QNAK (255-258) CH2

Nucleotide sequence:

30 cctgaactctctgggggaccgtcagttctctcttcccccaaaacccaaggacaccctcatgatctccagaacgtgaaggtcac
atgcgtgtgtgtgagctgagccacgaagaccctgaggtcaagttcaactggtacgtggacggcgtggaaggtgcaataatgccaa
gacaaagccgcgggaggagcagtagacaacagcagctaccgtgtgtgtagcgtctctcaccgtctcctgacacgaagctgctgaatg
gcaaggagtagaactgcaaggtctccacaaaagccctccagcccccacgagaaaacaaatctccaaagccaaa

Amino acid sequence

35 PELLGGPSVFLFPPKPKDTLMISQNAKVTCVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAK

34. RTPE/QNAK (255-258)CH2 WCH3

Nucleotide sequence:

40 cctgaactctgggggaccgtcagttctctcttcccccaaaacccaaggacaccctcatgatctccagaacgtgaaggtcac
atgcgtgtgtgtgagctgagccacgaagaccctgaggtcaagttcaactgtagctgtagcggcgtggaggtgcaataatgccaa
gacaaagccgcgggaggagcagtagacaacagcagctaccgtgtgtgtagcgtctcaccgtctgacacgaagctggtgatg
gcaaggagtagaaggtgcaaggtctcacaagaagccctccagcccccacgagaaaacaaatctccaaagccaaaggcagccc
cgagaaccacaggtgtacacctgcccctcctccggatgagctgaccaagaaccaggtcagcctgactgctggtcacaagg
45 ctctatccagcgcacatccgctggagtgaggagagcaatggcagccgggagaacaactacaagacacgcctccctggtg
actccgagcgtctctctctctacagcaagctcaccgtggacaaagcaggtggcagcaggggaacgtcttctcatgctcctg
atgcatgaggtctgcacaacactacacgcagaagacctctcctgctctccgggtaaatgatctaga

Amino acid sequence

50 PELLGGPSVFLFPPKPKDTLMISQNAKVTCVVDVSHEDPEVKFNWYVDGVEVHN
AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG

WO 2005/017148

PT/US2003/041600

QPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPV
LDSGGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNNHYTQKSLSPGK

35. 2H7 scFv VH L11S (SSS-S)H RTPE/QNAK (255-258)CH2 WCH3

Nucleotide sequence:

5 aaagctgcccgcattggaatttcaagtcagattttcagcttctgctaatacagtcgttcacgtacataattgccagaggacaattgttctct
ccagctctccagcaatcgtgtcgtcctccaggggagaaggtgcacaatgacttcagggccagctcaagtgtaagttacatgcaat
10 ggtaccagcaganaagccagatctcccccacacccctggalltatccccacacacccgtgctctggagtcctcgtcgttcacgtg
gcagtggtgctgggacaccttactctctcaacaatcagcagagtgaggctgaagatgctgccatttactgccagcagtgaggatt
taaccacccacgttgcgtgctgggaccaagctggagctgaagatggcgggtgctggcggtggtggtgctgagcagagtg
15 ggagctctcaggcttatctacagcagctcggggtgagtcgggagggcctcagtgaaagatgctctcaaggctctggc
tacacattaccagttacaatgatcactggtaaagcagacacctagacaggcctggaatggattggagctatttaccaggaaat
gggtatctctcaacaatcagagttcaaggccaaggccacactgactgtagacaaatctccagcacagctacatgcagctcag
cagctgcacatctgaagactctcgggtctatttctgtcgaagagtggtgtactatagtaactcttactgglaattcgatgtctggggcag
20 agggaccacggctaccgtctctctgatcaggagcccaaatctctgacaaaactcacatccccaccgtctcagcaccgtgaact
ctggggggaccgtcagctctctctctcccccacaaagcagacacccctcatgaltccagacagcgtcaaggttcacatgctggg
tggtggactgtggaccaggaagacccctgaggtcaagttcaactgtacgtggacggcgtggaggggtgataatggccaagacaaagc
cggcgggagggagcagttacacagcagctacgtgtgtggcagcgtcctaccgtctgaccacaggactggctgaatggcaaggag
25 taaggatgcagaggtctcaacaanaagccctccagcccccagcagaaacacatccaaagccaaggcgagccccgagaacc
acaggtgtacacacctgcccccacccgggagtgagctgaccaagaaccaggtcagcctgacctgctgcaaggctctatccc
agcagacatcgccgtggagtggggagcagtgggcagccgggagaaacacacacagacacacccgtgctggactgcagc
gtcctctctctctacagcagagctcaccgtggcagaagagcaggtggcagcaggggaacgttctctatgctcgtgatgatgag
30 gctgtcacacacactacacagcagaagacccctcctgtctccgggtaaatgatctaga

Amino acid sequence

MDFQVQVIFSLFISASVIIARGQIVLSQSPAILASASPGKEVTMTCRASSVSYMHWY
QOKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATY YCQQWS
35 FNPPTFGAGTKLELKDGGGSGGGGSGGGGSGQAYLQQS GAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGGDTSYNQKFKGKATLVVDKSSS
TAYMQLSSLTSEDSAVYFCARVYVYYSNSYWFYDFVWGTTVTYVSSDQEPKSSDK
THTSPSSAPELLGGPSVFLFPPKPKDTLMISQNAKVTCVVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREEQYNSTYRVVSVLTVTLHQDWLNGKEYIKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
35 NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNNHYTQKSLSL
SPGK

36. 2H7 scFv VH L11S (CSS-S)H RTPE/QNAK (255-258)CH2 WCH3

Nucleotide sequence:

40 aaagctgcccgcattggaatttcaagtcagattttcagcttctgctaatacagtcgttcacgtacataattgccagaggacaattgttctct
ccagctctccagcaatcgtgtcgtcctccaggggagaaggtgcacaatgacttcagggccagctcaagtgtaagttacatgcaat
gtaccagcaganaagccagatctcccccacacccctggalltatccccacacacccgtgctctggagtcctcgtcgttcacgtg
gcagtggtgctgggacaccttactctctcaacaatcagcagagtgaggctgaagatgctgccatttactccagcagtgagatt
45 taaccacccacgttcgtgctgggaccaagctggagctgaagatggcgtgctcggcggtggtggtgctgagcagtgaggaggtg
ggagctctcaggcttatctacagcagctcgggctgagctggtgagggcctcagtgaaagatgctctgcaaggctctgtggc
tacacattaccagttacaatgatcactgggttaaagcagacacctagacagggcctggaatggattggagctatttaccaggaaat
gggtatctctcaacaatcagaattcaaggccaaggccacactgactgtagacaaatctccagcagacactacatgcagctcag
45 cagcgtctcagctgaagactctcgggtctatttctgtcgaagagtggtgtactatagtaactcttactgctgtagtctgctgggac
agggacacggtaaccgtctctctgatcaggagcccaaatctgtgacaaaactcacatccccaccgtctcagcagcctgaact
50 cctggggggacgctcagctctctctctcccccacaaagcagacacccctcatgaltccagacagcgtcaaggtacatgctggtg
tggtggactgtgagccaggaagacccctgaggtcaagttcaactggatcgtggacggcgtggaggtgataatggccaagacaaagc

WO 2005/017148

PCT/US2003/041600

cgcggaggagcagtcacaacgacgacgaccgtgtggcagcgtctcaccgtctcgcaccaggactggctgaatgccaaggag
tacaaggcgcaagggtctccaacaaagccctccagcccccacgcagaaacaatccaaagcgaaggcagccccgagaacc
acagggtgacacacctgcccccaccggatgagctgaccaagaacacggcagcctgacctggctgcaaaaggcttctatccc
agcgacatcgccgggtggaggagcaatggcgacggcggagaaacactacaagaccacgcctccgctgctgagctccgacg
gctctctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtctctatctctcgtcgtgatcgatgag
gctctgcacaacactacacgcagaaagacgtctcctgctctcgggtaaatgatctaga

Amino acid sequence

MDFQVQIFSLLSASVIIARGQIVLSQSPAILASAPGKEVMTTCRASSVSVMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGGTSYSLTISRVEAEDAATYYCQQWS
FNPTFGAGTKLELKDGGSGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDASVYTCARVYYNSNSYWFVDFVWGTTTIVTSSDQEPKSCDK
THTSPSSAPELLGGPSVFLFPPKPKDTLMISQNAKVTCVVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTTTPVLDSGSFFLYSKLTVDKSRWQQGNVFSCSVMEALHNHYTQKSLSLSPGK

36. K290Q CH2 region

Nucleotide sequence:

cctgaactcctgggggaccgtcagctctctctcccccacaaacccaaggacacctcatgatctccggaccctgaggtcac
atgcgtgggtggagcgtgagccacgaagacctgaggtcaagttaacctgtacgtggagcggcgtgaggtgcataatgccaa
gacacagccgcggggaggagcagtcacaacgacgtaccgtgtgtcagcgtctcaccgtctcgcaccaggactggctgaatg
gcaaggagtcacaaggtcgaaggtctccacaanaagccctccagcccccacgcagaaacaatctccaaagccaaa

Amino acid sequence:

PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTQPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAK

37. K290Q CH2 WCH3

Nucleotide sequence:

Cctgaactcctgggggaccgtcagctctctctcccccacaaacccaaggacacctcatgatctccggaccctgaggtca
catgcgtgtgtggagcgtgagccacgaagacctgaggtcaagttaacctgtacgtggagcggcgtgaggtgcataatgccaa
agacacagccgcggggaggagcagtcacaacgacgtaccgtgtgtcagcgtctcaccgtctcgcaccaggactggctgaat
ggcaaggagtcacaaggtcgaaggtctccacaanaagccctccagcccccacgcagaaacaatctccaaagcgaaggcagcc
cggagaaccacaggtgtacacctgcccccacccgggagtgagctgaccaagaaccaggtcagcctgacctgctcgtgccaag
gcttctatccagcagacatcgccgtggaagtgaggagacaaaggcagccggagaaacactacaagaccacgcctcccgctg
gactccgagcggctctctctctacagcaagcaccgtggacaagagcaggtggcagcaggggaacgtctctctatgctccgt
gatgcatgaggtcgtgcacaacactacacgcagaagagcctcctcgtctcgggtaaatgatctaga

Amino acid sequence:

PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
AKTQPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG
QPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQENNYKTTTPV
LDSGSFFLYSKLTVDKSRWQQGNVFSCSVMEALHNHYTQKSLSLSPGK

38. 2H7 scFv VH L11S (SSS-S)H K290Q CH2 WCH3

Nucleotide sequence:

aaagcttgcgccatggatttcaagtgacgatgttccagcttctgtaatacagtgcttcagcacaataatgccaagagacaattgttctct
ccagctctccagcaatcctgtctgcatctccagggagagagtcacaatgactgcaggccagcctcaagtgtaagtgtacatgcact

WO 2005/017148

PCT/US2003/041600

ggtaccagcagaaggcagatctctccccaaccctgattatgccccatc caacctggtctctggagtcctctgctcgttcagtg
gcagtggtgctggagaccltactctcaacaatcagcagatggaggtgaagatgctgccattatctgccagcagtggaattt
taaccacaccacgttcgtgctgggaccaagctggagctgnaagatggcgggtgctcggcggtggtgagctggagctggagggatg
ggagctctcagccttatctacagcagctcggggtgagtcggtgaggtcggggtcctcagtgaaagatgctctcgaagctctcggc
tacaatttaccaggttacaattcagctgggtaaaagcagacacctgagcagggcctggaatggattggagctattatccaggaat
5 ggtgatacttctacaatcagagttcaaggggcaaggccacactgactgtagacaantctccagcacagcctacatgcagctcag
cagcctgcacatctggaagcagctcggctctattctgtgcaagatggtggtgactatagtaactcttactgtaactcagatgctcgggac
agggacacagctggacaccgtctctctgtatcaggagcccaaatctctgacaaactcacacatcccacgcctctcagaccctgaact
ctctggggggaccgtcgtctctctctctcccccacaaagcagacccctcatgatctccggaccctcaggttcacatgcgtggg
10 tgggtgacgtgagccacgaagacctgagtgcaaggtcaactggtacgtggagcggcgtggaggtgataatggccaagacacagc
cgcgggagagcagctacacagcagcagctaccgtggtgacgctcctcaccgtcctgcacagcaggtgctgaatgcaaggag
tacaagtgcaaggcttccaacaaagccctccagcccccacgaaacaaatctcnaagccaaagggcgacccccgagaacc
acaggtgtacacccctgccccatccgggatgagctgacaagaacacagtgacgctgacctcgtctgcaagggtctctatccc
agcgacatcgccgtggagtgaggagcaatggcgacgccggagaacactacaagaccacgtccctcgtgctgactccagcag
15 gctccttctctctacagcagctcaccgtggacaaagcaggtggcagcaggggaacgtctctctcatgctccgtgatcatgag
gctctgcacaaccactacacgcagaagagcctctcctctcgggtaaatgatctaga

Amino acid sequence:

MDFQVQIFSLIASVHARGQIVLSQSPAILASPGKEKVTMTCRASSVSVMHYW
20 QQKPGSSPKPWYAPSNLASGVPARFSGSGGTSYSLTISRVEAEDAATYYCQQWS
FNPTFTAGAGTKLELKDGGGSGGGGSGGGSSQAYLQQSGAESVRPGASVKMSCK
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKALTLDKSSS
TAYMQLSSLTSEDSAVYFCARVVYYNSNYWYFDVWGTGTTVTVSSDQEPKSSDK
THTSPSPASPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVFKNWYV
25 DGVVEVHNAKTQPREQYNSYTRYVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
KTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMEALHNHYTQKSLSL
PGK

30 39. 2H7 scfv VH L11S (CSS-S)H K290Q CH2 WCH3

Nucleotide sequence:

aagcttgccgcagtgattttcaagtgacagattttagctctcgtatcatcagtgcttcagtcataatgcccagagacaaaattgtctct
cccagctccagaactcctgtctgctatctcagggggaagagtcacaaatgacttgagcggccagctcaagtgtaattatcagact
ggtaccagcagaagccagagatctcccccaaacctggattatgccccatcaacctggtctctggagctcctcgtcgttcactg
35 gcaatgggtctgggaccttactctctcacaatcagcagagtgagggtgaagatgctgccattatattaccgcaagcagtggaattt
taaccacaccacgttcgtgctgggaccaagctggagctgaaagatggcggtggtcggcggtggtgagctggagggaggtg
ggagctctcagccttatctacagcagctcggggtgagtcggtgagcgtgggacctcagtgaaagatgctcgaagctcttggtgc
tacaatttacaagttacaatattgcactgggtaaagcagacacctagacagggtcctggaatggattgagagctattatccagaana
ggtgatacttctacaatcagaagttcaaggggcaaggccacactgactgtagacaaatcctccagcagcctacatgcagctcag
40 cagctgacatctgaagactctcggctctatttctgtgcaagngtgggtgactatagtaactctactggtacttctgattgctcgggac
agggacacacagctcaccgtctctctgtatcaggagcccaaatctgtgacaaaactcacacatcccaccgtcctcagaccctgaact
ctctggggggacgctcgtctctctctctcccccacaaagcagacccctcatgatctccggaccctcaggttcacatgcgtggg
tgggtgacgtgagcagcagaagacctgaggttcaggttcaactggtacgtggagcggcgtggaggtgacatgaatgctcgggac
cgcgggagagcagctacacagcagctaccgtgtgtgacgctcctcaccgtcctgcacacagctggctgctgaatgcaaggag
45 tacaagtgcaaggcttccaacaaagccctccagcccccacgnaaaactctcnaagccaaagggcagccccggaacac
acaggtgtacacccctgccccatccgggatgagctgacnaagaacacagtgacgctgacctcgtcggctcaagggtctctatccc
agcgacatcgccgtggagtgaggagcaatggcgacggcgagaacaaactacaagaccacgtccctcgtcgtgactccgagc
gctctcttctctcagacaggtcaccgtggcagaagcagctggcgacagcaggggaacgtcttctcatgctcgtcgtgatgatgag
gctctgcacaaccactacacgcagaagagcctctcctgctcctcgggtaaatgatctaga

Amino acid sequence:

WO 2005/017148

PT/US2003/041600

MDFQVQIFSLILISASVILARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QKPKGSSPKPWYIAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKDGGGSGGGGSGGGSSQAYLQQSGAESVRPGASVMSKSC
ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFGKATLTVDKSSS
5 TAYMQLSSLTSEDSAVFYFCARVYVYSNSYWFYDVWGTGTTVTVSSDQEPKSCDK
THTSPSSAPELLGGPSVFLFPPKPKDITLMISRTPTEVTCVVVDVSHEDPEVKFNWYV
DGVEVHNAKTPQPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
KTISKAKGQPRPEQVYVTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
10 NYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSQSVMEALHNHYTQKSLSLS
PGK

40. A339PCH2

Nucleotide sequence:

cctgaactcctgggggaccgtcagctctctctctcccccaaaacccaaggacacctcatgatctccggacctcagggtcac
15 atgcgtggtggtggacgtgagccacgaagacctgagggtcaagtcaactgggtacgtgacggcgtggaggtgcataatgccaa
gacaaagccgcggggagagcagtgacaacacgacgtaccgtgtgggtcagcgtctccaccgtctgcaccagcagctgagctgaatg
gcaaggagtacaaagtgcacaggtctccaacaagccctccagcccccacagagaaacaatctccaaaccccaaa

Amino acid sequence:

PELLGGPSVFLFPPKPKDITLMISRTPTEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
20 AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKPK

41. A339P-CH2 WCH3

Nucleotide sequence:

cctgaactcctgggggaccgtcagctctctctctcccccaaaacccaaggacacctcatgatctccggacctcagggtcac
25 atgcgtggtggtggacgtgagccacgaagacctgagggtcaagtcaactgggtacgtgacggcgtggaggtgcataatgccaa
gacaaagccgcggggagagcagtgacaacacgacgtaccgtgtggtcagcgtctccaccgtctgcaccagcagctggtcgaatg
gcaaggagtacaaagtgcacaggtctccaacaagccctccagcccccacagagaaacaatctccaacccaaggagcagccc
30 cgaagaaccacaggtgtacacctgccccctccgggatgagctgaccaaagaacagggtcagcgtgacctgctgtgcacaaagg
cttctatccagcgacatcgcctgtggagtgaggagagcaatggcgagccggagaacaactacaagaccagcctcccgtcgtgg
actccgagcgtcctctctctctacagcaagctcaccgtggacaagagcaggtggcagcaggggaacgtctctcatgctccgtg
atgatgaggctctgcacaaccactacacgacgaagagacctctccctgtctcgggtaaatgatctaga

Amino acid sequence:

PELLGGPSVFLFPPKPKDITLMISRTPTEVTCVVVDVSHEDPEVKFNWYVDGVEVHN
35 AKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKPKG
QPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPV
LDSDGSFFLYSKLTVDKSRWQQGNVFSQSVMEALHNHYTQKSLSLSPGK

42. 2H7 scFv VHL1S (SSS)-SII A339P CH2 WCH3

Nucleotide sequence:

aagctgcgcgcagtgatttcaagtcagattttcagctctcctgtaatacgtgttcacgtacataattgccagaggacaaattgtctct
cccagctctccagcaatcctgtctgtcctccaggggagaaagtcacaaatgacttcgaggcgccagctcaagtgtaagttacatgcact
45 ggtaccagcagaagccaggatctccccaacctgcgattatgcctccacaaacctgctgtctgtgagctcctgtctgtcgtcagtg
cagtggtgctgggacctcttactctctcacaatcagcagagtgagggtgaagatgctgccatttacttgcacagcagtgagggtt
taaccacacacagctgtcgtgtcgggacgaagctggagctgaagaatgctggcgtggcgtggggtggtgatctggaggagggtg
ggagctctcagcttatctacagcagctgtgggctgagtcggtagggcctgagcaagatgctcgtcgaagcgtctgtcgtc
20 tacaattaccagttacaatgatcactgggttaagcagacacctagacagggcctggaatgattggagctatttaccaggaat
ggtgatactctacaatcagaatgtcaaggcgcaaggccacactgacttgagacaatactccagcacagcctacatgcagctcag
cagcctgcactgaagactcgtcgtctattctgtgcgaagtggtgtactatagtaactcttactgctgatgctgtgggcac

WO 2005/017148

PC/T/US2003/041600

agggaccacgcgtcaccgtctctctgatcaggagcccaaatctctgacaaaactcacacatccccaccgtctcagcacctgaact
cctcgtggggaccgtcagctctctctctcccccaaaacccaaggacacctcatgatctcccggagccctgagggtacatgcgtgg
tggtggacgtgagccacgaagacctgaggtcaangttcaactggtacgtggagcgcgtggaggtgcataatgccaaagacaaagc
cgcgggagagcagatcaaacagcacgtaccgtggtggtcagcgtctcaccgtcctcaccaggagactgctgaatgccaaaggag
5 tacaagtgcaggtgtccaaacaagccctccagcccccattcgaaaaactctccaaaccaaagggcagccccgagaacc
acaggtgtcacacctgcccccaccggatgagctgaccaagaaccaggtcagcctgacctgcctggtcgaaggctcttatccc
agcagcatcggcgtgaggtggagagcaatggcgagccggagaacaactacaagaccagcctccgctgctgactccgacg
gctcctctctctctacagcaagctaccgtggacaagacaggtggcagcagggggaactctctcatgctcctgtagatgag
gctctgcacaaccactacacgcgaagagcctctcctctctcgggtaaatgatctaga

10 Amino acid sequence:
MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQWWS
FNPTTFGAGTKLELDGGSGGGGGSSQAYLQSGSAGSVRPGASVKMSCK
15 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKALTIVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNYWYFDVWGTGTVTVSSDQEPKSSDK
THTSPSSAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV
DGVEVHNAKTKPREEQYNSTYRVVSVLTIVLHQQDWLNGKEYCKVSNKALPAPIE
KTISKPKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
20 NYKTTTPVPLDSGSFFLYSKLTVDKSRWQQGNVFSCSVMEALHNHYTQKSLSLS
PGK

43. 2H7 scFv VHL11S (CSS-S)H A339P CH2 WCH3
25 Nucleotide sequence:
aagcttgcgccatggatgttcaagtgacagatttcaactctcgtatcaatcagtgcttcacgtacataatgccagaggacaaattgttct
cccagctccagcaatctctgtctcatctccagggagagaaggtcacaatgactgcagggccagctcaagtgtaagtacatgcaat
ggtaccagcagaagccaggaatcctcccccaaacctggaattatgcccacccaactcgtgttggagtcctgtctcgtctcagtg
gtagtgggtctgggacctcttactctctcaaatcagacagagtgagggtcgaagatgctgccactattactgccagcagtggaagt
30 taaccacccacggttcggtctgggaccacagctggagctgaagatggcggtggtcggcggtggtggatctggagggaggtg
ggagctctcagcgttattctacagcagctcgggctgagtcggtggagcctgggacctcagtggaagatgtctcagggccttggc
tacacatttaccagttacaatgcaactgggtaagcagacacctagacagggccttggaatggattgagctattatccagganaat
ggtagatcttcaaatcagaagttcaaggcccaagccacactgactglagacaaatctccagcagcagcctacatcgactcag
cagcctgacatctgaaagcctcgtcgtctatttctgcaagagtggtgtactatagtaactcttactggtactctgctggggac
35 agggaccacggtcaccgtctctctgatcaggagcccaaatctgtgacaaaactcacacatccccaccgtctcagcacctgaact
ctcggggggcagcgtcagttctctctcccccaaaacccaaggacacctcatgatctcccggaccctgaggtcacatcggtg
tggtgagctgagccacgaagacctgaggtcaagttcaactgtacgtggagcgcgtggaggtgcataatgccaaagacaaagc
cgcgggagcagcaglacaaagcagctaccgtgtgtgctcagcgtctcaccgtcctgcaccagcagctgctgaatgccaaagc
tacaagtgcaagcttccaaacaagccctccagcccccacgagaaaacaactccaaaccacaaaggcagccccgagagaacc
40 agcagctgtacacctgcccctccacccggatgagctgaccaaagaaccaggtcagcctgacctgctgttcaaggtcttatccc
agcagcatcggcgtggagtgaggagacaaatggcgagccggagaaactacaagaccagcctccgctggtgagctccgacg
gctcctctctctctacgaagctcaccgtggacaagcaggtggcagcaggggaactctcttactgctcctgagctgagatcag
gctctgcacaacctacacgcgaagagcctctcctctcctcgggtaaatgatctaga

45 Amino acid sequence:
MDFQVQIFSFLISASVIIARGQIVLSQSPAILSASPGEKVTMTCRASSSVSYMHWY
QQKPGSSPKPWYAPSNLASGVPARFSGSGSGTSYSLTISRVEAEDAATYYCQWWS
FNPTTFGAGTKLELDGGSGGGGGSSQAYLQSGSAGSVRPGASVKMSCK
50 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPNGDTSYNQKFKGKALTIVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYNSNYWYFDVWGTGTVTVTVSSDQEPKSCDK
THTSPSSAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYV

WO 2005/017148

PCT/US2003/041600

DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
KTISKPKGQPREEPVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN
NYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCFSVMHEALHNHYTQKSLSLS
PGK

5

44. G28-1VH

Nucleotide sequence:

gcggctccagctcgacgagctctgacctgagctggaaaagcctggcgcttcagtggaattctctgcaaggctctgttactcatic
10 actgctcacaatatgaactggggtgaagcagaataatgaaagagccttgagtggaattggaatatgatccttattatgggtgacta
ctcaacaacgggaagtctcaaggcgaagccacattgactgtagacaaatctccagcacagcctacatgcagctcaagagctctgac
atctgaggactctgagctctatctatgtgcaagatcggcggcctatggactactggggtcaaggaaacctcagtcaccgtctctct
gatcag

15 Amino acid sequence:

AVQLQQSGPELEKPGASVKISCKASGYSTGYNMNWVKQNNGKSLIEWIGNIDPY
YGGTTYNRKFKGKATLTVDKSSSTAYMQLKSLTSEDSSAVVYCARSVGPMDYWG
QGTSVTVSSDQ

20 45. G28-1VL

Nucleotide sequence:

aagcttgccgccatggtatccacagctcagttccttgggttgctgctgctgtggttaccaggtggcagatgfgacatccagatgact
25 agtctcagctccctatctgcatctgtgggagagactgtcaccatcacatgtcgaacaagtgaatatgttacagttattggcttggt
atcagcagaacaacgggaaatctcctcagctcctgtctcttttgcacaaaccttagcagaaggtgtgcatcaagggttcagtgga
gtggtacagcagcacagttttctctgaagatcagcagcctgagcctggaagtctggaagtatttctgtcacacatcctcgataat
cctgtgagcttccgggtggagccaccgaactggagatcaaaaggtggcggctggcggcgggtgtggtgtgggtggcggcggat
cgtga

30 Amino acid sequence:

MVSTAQFLGLLLLWLTGGRCDIOMTQSPASLSASVGETVTTICRTISENVVSYLAW
YQQKQKGKSPQLLVFAKTLAEGVPSRFSGSGSTQFSLKISSLQPEDSGSYFCQHH
DNPWTFGGGTELEIKGGGGSGGGSGGGSS

35 46. G28-1 scFv

Nucleotide sequence:

aagcttgccgccatggtatccacagctcagttccttgggttgctgctgctgtggttaccaggtggcagatgfgacatccagatgact
agtctcagctccctatctgcatctgtgggagagactgtcaccatcacatgtcgaacaagtgaatatgttacagttattggcttggt
40 atcagcagaacaacgggaaatctcctcagctcctgtctcttttgcacaaaccttagcagaaggtgtgcatcaaggttcagtgga
gtggtacagcagcacaggtttctctggaagatcagcagcctgagccttggaagtatttctgtcaacatcattccgataat
ccgtggagcttccgggtggagccaccgaactggagatcaaaaggtggcggctggcggcgggtgtggtggcggcggat
cgtcagcgggtcagctcgcagcagctcgcagctggaactgagctggaaaagcctggcgttcagtggaagtatttctgcaaggtctctgttact
cattacatgctcacaatatgaactgggtggaagcagaataatggaagagccctgagtggnftggaatatattgatccttattatgttgtt
actacctacaacgggaagtcaagggtcgaagccacattgactgtagacaaatctccagcacagcctacatgcagctcaagagct
45 gacatctgaggactctgcagcttattactgtgcaagatcggcggcctatggactactgggtcagaagaaacctcagtcaccgtctc
ttctgatcag

50 Amino acid sequence:

MVSTAQFLGLLLLWLTGGRCDIOMTQSPASLSASVGETVTTICRTISENVVSYLAW
YQQKQKGKSPQLLVFAKTLAEGVPSRFSGSGSTQFSLKISSLQPEDSGSYFCQHH
DNPWTFGGGTELEIKGGGGSGGGSGGGSSAVQLQQSGPELEKPGASVKISCKA

WO 2005/017148

PCT/US2003/041600

SGYSFTGYNMNWKQNNKGSLEWIGNIDPYYGGTTYNRKFKGKATLTVDKSSST
AYMQLKSLTSEDSAVYYCARSVGPMDYWGQTSVTVSSDQ

5 47. G28-1 VHL11S

Nucleotide sequence:

gcggtccagctgcagcagctctggacctgagtcggaaaagcctggcgcttcagtgaagatttctgcaaggctcttggttactcattc
actggctacaatatgaactgggtgaagcagaataatggaagagccttgagtggaattgatacttattatgtgggtacta
10 cctacaaccggaaagtcaaggcgaagccacattgactgtagacaataatctccagcacagcctacatgcagctcaagagctgcac
atctgaggaactctgcagctctattactgtgcaagatcggtcgccctatgactactggggtcaaggaaactcagtcaccgtctctct
gatcag

Amino acid sequence:

15 AVQLQSGPSEKPGASVKISCKASGYSFTGYNMNWKQNNKGSLEWIGNIDPYY
GGTTYNRKFKGKATLTVDKSSSTAYMQLKSLTSEDSAVYYCARSVGPMDYWGQ
GTSVTVSSDQ

20 48. G28-1 VHL11S scFv

Nucleotide sequence:

aagcttccgccatggtatccacagctcagttccttgggttctgctgctgtggcttacaggtgcagatgtgacatccagatgactc
agcttccagcctccctatctgcatctgtgggagagactgtcaccatcacatgtcgaacaagtgaataattttacagttatttgcttgg
25 atcagcagaacagggaanaattcctcagctcctgtctcttttgcataaaccttagcagaaaggtgtgccatcaagggtcagtgga
gtgcatcaggcacacagtttctctgagatcagcagcctgcagcctgaagattctggaagtatttctgcaacalcattccgataat
ccgtggagcttccgtggaggcaccgaactggagatcaaaagtgccggtggctcggcggtgtggtgggtcgggtggcggggag
cgtcagcgttcagctgcagcagctgtgacctgagtcggaaaagcctggcgcttcagtggaagatttctgcaaggcttctggttact
cattcactggctacaatatgaaactgggtgaagcagaataatggaagagccttgagtggaattggaatatgtatccttattatgtggt
actacctaacccggaagttaagggaagccacattgactgtagacaatactccagcacagcctacatgcagctcaagagct
30 gacatctgaggactctgcagctctattactgtgcaagatcggtcggccctatggactactgggttcaaggaaactcagtcaccgtctc
ttctgatcag

Amino acid sequence:

35 MVSTAQFLGLLLLWLTGGRCDIQTQSPASLSASVGETVTTTCRTSENVSYLAW
YQQQKQKSPQLLVSFAKTLAEGVPSRFSGSGTGQFSLKISLQPEDSGSYFCQHS
DNPWTFGGGTLEIKGGGSGGGGSSAVQLQSGPSEKPGASVKISCKA
SGYSFTGYNMNWKQNNKGSLEWIGNIDPYYGGTTYNRKFKGKATLTVDKSSST
AYMQLKSLTSEDSAVYYCARSVGPMDYWGQTSVTVSSDQ

40 49. G28-1 scFv (SSS-S)H WCH2 WCH3

Nucleotide sequence:

aagcttccgccatggtatccacagctcagttccttgggttctgctgctgtggcttacaggtgcagatgtgacatccagatgactc
agcttccagcctccctatctgcatctgtgggagagactgtcaccatcacatgtcgaacaagtganaattgttacagttatttgcttgg
45 atcagcagaacagggaanaattcctcagctcctgtctcttttgcataaaccttagcagaaaggtgtgccatcaagggtcagtgga
gtggatcaggcacacagtttctctgagatcagcagcctgcagcctgaagattctggaagtatttctgcaacalcattccgataat
ccgtggagcttccgtggaggcaccgaactggagatcaaaagtgccgggtggctcggcggtgtgggtcgggtggcggggag
cgtcagcgttcagctgcagcagctgtgacctgagctggaagagcctggcgcttcagtggaagatttctgcaaggcttctggttact
cattcactggctacaatatgaactgggtgaagcagaataatggaagagccttgagtggaattggaatatgtatccttattatgtggt
actacctaacccggaagttaagggaagccacattgactgtagacaatactccagcacagcctacatgcagctcaagagct
50 gacatctgaggactctgcagctctattactgtgcaagatcggtcggccctatggactactgggttcaaggaaactcagtcaccgtctc
ttctgatcagatcaggagcccaactcttgcataaacctcacatccaccgtctctcagcacctgaaactcgtggcggaagcctgc

WO 2005/017148

PC/T/US2003/041600

agcttctctctcccccaaaccaaggacacctcatgatctccggaccctgaggctcacatgctgggtggtggagcgtgagcc
acgaagacctgaggtcaagttcaactggtacgtgacggcgtggaggtgcataatgccaaagcaaaagccggggaggagaca
gtacaacagcacgtaccgtgtggtcagcgtctcaccgtctcgaaccaggactgctgaatggcgaaggagtagaaggtcgaaggc
tccaacaaagccctccagcccccacgtgagaaaacaatctccaagagccaaaggcagcccccagaaocacaggtgtacacct
5 gcccccatccgggatgagctgaccaagaaccaggctgagctgacctgacctgctcaaaaggctcttatccocagagacatgcccgtg
gagtgaggagacgaatggcgccggagaaacaactacaagaccagcctcccgtgctgactccgacggctctcttctctac
agcaagctcaccgtggacagagcaggtggcagcagggagacgtctctcatgctccgtgatcagtgaggtctgcacaaacct
acacgcagaagagcctctcctgtctccgggtaaatgatctaga

10 Amino acid sequence:
MVSTAQFLGLLLLWLTGGRCDIQMTQSPASLSASVGETVTITCRTSENVVSYLAW
YQQKQKGSQQLLVSAKTLAEGVPSRFSGSGSGTQFSLKISSLQPEDSGSYFCQHHSA
DNPWTFGGGTELEIKGGGSGGGGSGGGSSAVLQQSGPELEKPGASVKISCKA
SGYSFTGYNNMNWVKQNNGKSLIEWIGNIDPYYGTTYNRKFKGKATLTVDKSSST
15 AYMQLKSLTSEDASVYYCARSVGPMIDYWGQGTSTVTVSSDHDQEPKSSDKTHTSP
PSSAPPELLGGPSVFLFPPKPKDTLMISRTPEVTVVVDVSHEDPEVKFNWYVDGVE
VHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIK
AKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKT
TPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSSVMHEALHNHYTQKSLSLSPGK

50. G28-1 scFv IgAW H IgG1WCH2 WCH3

Nucleotide sequence:
aagcttgcccatggatcacacagctcagttctctgggttgcgtgctgctggtgactaacaggtggcagatgtgacatccagatgactc
agctctcagcctcctcatctcgtctgtggagagactgtcaccatcacatgtcgaacaaagtgaataatgttacagtatttggcttgg
25 atcagcagaacaggcgaaatatctctcagctcctgtctcttttgcacaaacctagcagaaggtgtgctccatccacagcagcagc
gtggaatcagccacacagcttttctgaagatcagcagcctcagcctgaagatctggaagtattctgtcaacatcatccgataat
ccgtgacgttccgtggagcaccgaactggagatcaaaagtggtggcgtgctcggcggtggtgggtggcggcggtgagc
cgtcagcgggtccagctgcagcagctggacgtgagctgctggaagagcctggcgcttcagtgaaagtattcctcgaagcctctcgttact
cattcactgctcacaatatgaactgggtgaagcagaataatgaaagagcctgagtgattgaaatatgtaccttattatggtgtg
30 actacctacaacccgaaggtcaaggcgaagccacattgactgtagaacaatctccagcagacgtctactgacgtcaagagct
gacatctgaggactctgcagctcttactgtgcaagatcggctggccctatggactactgggtcgaaggaaacctcagctcaccgtctc
ttctgactagccaggttctcctcaactccactaccctcatctcctcaactccactaccctcatctcctcatggcagcctgaactcctgg
gggagcctcagcttctctctcccccaaaccaaggacacctcatgatctccggaccctcagggtgcacatgctggtggtg
gacgtgagccacgaagaccctgaggtcaagttcaactgtacgtggacggcgtggaggtgataatggccaaagacaaaagcccg
35 ggaggagcagatcaacacagcagctacgtgtgtcagcgtcctcaccgtcctcgtcaccagcagctgctgaatggcgaaggagtagaa
gtgcaaggtctcacaacaaagccctccagcccccacgtgagaaaacaactctcaanagccaaaggcagcccccgaagaccacag
tgtacacctgcccccatccgggagatgagctgaccaagaaccagctgagcgtgacctgctgctcaaaaggctctctatccacagga
catcgccgtgggtgggagagacaaaggcagccggagaaacaactacaagaccagcctcccggtgctgactccgagcgtcct
tctctctcagcagcctcaccgtggacagagcaggtggcagcaggggaacgtcttctcatgctccgtgatgcagtaggctgtg
40 cacaacctacacagcgaagcagcctcctcctcctcctcgggtaaatgatctaga

Amino acid sequence:
MVSTAQFLGLLLLWLTGGRCDIQMTQSPASLSASVGETVTITCRTSENVVSYLAW
YQQKQKGSQQLLVSAKTLAEGVPSRFSGSGSGTQFSLKISSLQPEDSGSYFCQHHSA
45 DNPWTFGGGTELEIKGGGSGGGGSGGGSSAVLQQSGPELEKPGASVKISCKA
SGYSFTGYNNMNWVKQNNGKSLIEWIGNIDPYYGTTYNRKFKGKATLTVDKSSST
AYMQLKSLTSEDASVYYCARSVGPMIDYWGQGTSTVTVSSDQPVSTPPTPTPTPT
PSPCAPPELLGGPSVFLFPPKPKDTLMISRTPEVTVVVDVSHEDPEVKFNWYVDG
VEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTI
50 SKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY

WO 2005/017148

PCT/US2003/041600

KTTPVLVDSGDSFFLYSKLTVDKSRWQQGNVFCSSVMHEALHNHYTQKSLSLSPG
K

51. G28-1 scFv VHL11S (SSS-S)H WCH2 WCH3

5 Nucleotide sequence:

aagcttgcgccatggtatcacagctcagttccttgggtgctgctgctgtggtcctacaggtggcagatgtgacatccagatgactc
agctccagcctccctatctgcatctgtgggagagactgtcaccatcacatgtcgaacaaggaaatgtttacagttatttgggtgggt
atcagcagaagaacggaaaatctctcagctcctgtctctttgcaaaaaccttagcagaagggtgtgccatcaaggctcagtgagca
gtggtacaggcacacagtttctctgaagatcagcagcctgcagcctgaagattctggaagtattctgtcaacaatcatccgataat
10 ccgtggacgttcgtgggagggcaccgaactggagatcaaaagggtggcgtgctcggcggtggtgtgggtggcggtggtggtggt
cgtcagcgtgccagctgtcagcagctgtgacctgagtcggaaaagcctggcgttcagtggaagattctcgtcaagctctctgtgtact
catctactggctacaatatgaactgggtgaagcagaataatgaaagagccttgagtggaagtattgacctattatgtgtgt
actacctacaacgggaagtcaaggcaagccacattgactgtgacaatctccagcagcgtcactgacgtcaagagctc
gacatctgaggactctgcatctattactgtgcaagatcgctggccctatggactactgggtcaaggcaacctgacccgtctc
tctgactcagggcccaaatctctgacaaaactcacatccccaccgtctcagcacctgaactcctggggggacgtcagttct
15 cttctccccccnaaaccccaaggaccacctcatgctccccgacctcagggtcagatgcgtgtgtgtggacgtgagccacgaa
gacctgaggatcaagtccaactggtacgtggacggcgtggaggtgcalaalgccaaagacaaggccggggagagcagctacaa
cagcagctacgtgtgtgacgtcctcaccgtcctgcaccaggactgctgaatggcgaaggagtagaagtgcaaggtctcccaac
aaaggccctccagcccatcagaaaacaaactccaaaggccagccccgagaaccacaggtgtacacacctgcccc
20 atccccggatgagctgaccaagaaccaggtcagcctgacgtgctgtcaaaagcctctatccagcgtacatgccgtggagtg
gagagcaatggcgagccgggagaacaactacaagaccagcctccgtgctggactccgagcgctcctctctcagcagaag
ctcaccgtggacaagagcaggtgtggcagcaggggaacgtctctctcgtcctgtagcatgaggtctgcacaaccactacacgc
agaagagcctcctcgtctccgglaaalgactga

25 Amino acid sequence:

MVSTAQFLGLLLWL TGRCDIQMTQSPASLSASVGETV TIT CRTSEN VVSYLAW
YQQKQKQSPQLLV SFAKTLAE GVP SRFSGSGSGTQFSLKISL QPESDSSGYFCQHS
DNWPWFGGTELEIKGGGGSGGGSGGGSSAVQLQQSGPSEKPGASVKISCKA
30 SGYSFTGYNMNWVKQNNGKSLIEWGNIDPYYGGITYNRKFKGKATLTVDKSSST
AYMQLKSLTSEDSAVYYCARSGPMDYWGQGTSTVTVSSDHDQEPKSSDKTHTSP
PSSAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVE
VHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTSK
40 AKAQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAWESWNGQPENNYTK
TPPVLVDSGDSFFLYSKLTVDKSRWQQGNVFCSSVMHEALHNHYTQKSLSLSPGK

52. G28-1 scFv VHL11S (CSS-S)H WCH2 WCH3

Nucleotide sequence:

aagcttgcgccatggtatcacagctcagttccttgggtgctgctgctgtggtcctacaggtggcagatgtgacatccagatgactc
agctctccagcctccatctgcatctgtgggagagactgtcaccatcacatgtcgaacaaggaaatgtttacagttatttgggtgggt
40 atcagcagaagaacaggaaaatctctcagctcctggctctctttgcaaaaaccttagcagaagggtgtgccatcaaggctcagtgagca
gtggtacagcacacagtttctctgaagatcagcagcctgcagcctgaagattctggaagtattttctgtcaacaatcatccgataat
ccgtggacgttcgtgggagggcaccgaactggagatcaaaagggtggcgtggcgtggcggtggtggtggtggtggtggtggtggtggt
cgtcagcgggtccagctgcagcagctgtgacctgagtcggaaaagcctggcgttcagtgaaagtattctcgaaggctctggttact
cattactggctacaatatgactgggtgaagcagaataatggaagagccttgagtggaatattgacctattattatgtgtgtgt
45 actactacaacccgaagtccaaggcgaaggccacattgactgtgacaaaatctccagcagacgctactgacgtcagcgtcaagagct
gacatctgaggactctcagctctattactgtgcaagatcggtcggccctatggactactgggtgcaaggaaacctcagtcacccgtc
tctgttccagggcccaaatctgtgacaaaactcacatccccaccgtctcagcagcctgaactcctggggggacgtcagctcct
ctctctccccccnaaaccccaaggaccctcatgctccccggacctcgtgaggtcagatcgtgtgtgtgagcgtgagcagcagaa
gacctgtgaggtcaagttcaactgtgtacgtggacggcgtggaggtgcatatgtccaaagacaaggccggggaggagcagatcaa
50 cagcacgtaccgtgtgtgacagctcctcaccgtcctgcaccaagactggtgaatggcaaggaggtacaaagtgcaaggtctccaa
aaaggcctccagcgtcactcagaaaacaatctcnaagccaaaggcgcccgagaaccacaggtgtgacacctgcccccc

WO 2005/017148

PC/T/US2003/041600

atccccggatgagctgaccaagaaccaggtcagcctgacctgcctggctcaaaaggctctatccagcgcacatgccgtggagtgga
gagagcaatggggagcgcgggaagcaactacaagaccagcctcccgctgctggactccagcggctcctctctcagacaag
ctcaccgtggacaagagcaggtggcagcaggggaacgtctctcatgctccgtgatgatgaggtctgcacaaccactacacg
agaagagcctctccctgtctcgggtaaatgatctaga

5

Amino acid sequence:

MVSTAQFLGLLLWLTGGRCDIQMTQSPASLSASVGETVTITCRTSENVVSYLAW
YQQKQKGSPQLLVSAFAKTLAEGVPSRFSGSGGTQFSLKISSLPEDSGSYFCQHHS
DNPWTFGGGTELEIKGGGSGGGGSGGGSSAVQLQSGPSEKPGASVKISCKA
SGYSFTGYNNMNWVKQNNGKSLIEWIGNIDPHYGGTTYNRKFKGKATLTVDKSSST
10 AYMLKSLTSEDSAVYYCARSVGPMIDYWGQGTSTVTVSSDQEPKSCDKTHTSPSS
APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVH
NAKTKPREBQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIETISKAK
GQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPP
15 VLDSGSGFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKLSLSLSPGK

53. G28-1 seFv VH L11S (CSC-S)H WCH2 WCH3

Nucleotide sequence:

aaagtggccgatgtatccacagctcagttccttgggtgctgctgctgtggcttacaggtggcagatgtgacatccagatgactc
20 agtctccagctccctatctgcactgtgaggagactgtcacatcacatgtcgacaagaatgaaatgttaccagtatttggctgggt
atcagcagaaacagggaataatctctcagctcctgctctcttttgcaaaaccttagcagaagggtgctccatcaagggttcagtgga
ctggatcaggcacacagattttctcgaagatcagcagcctgcagcctgaagattctggaattattctgtcaacatcattccgataat
cgtggagacttctggggagcaccgcaactggagatcaaaagggtggcggctcggcggtgggtgggtgggtgggtgggtgggtgggt
25 cgtcagcggctcagcagcagctctggaactgagctcggaaaaagcgtggcgttcagtggaagatttctgcgaaggctctgtgtact
cttaccatggctcaatagatgggtggaagcagaataatggaagacccctgattggattggaatattgacttattatgtggtggt
actacctacaacgggaagtcaaggcccaagggccacafgacigtgacaaatctccagcagacgctcatgagcgtcgaagtgct
gacatctgagcagctgctcagctclattactgtgcaagatcggctggcctatgactactgggtcgaaggaaactcagtcacgctctc
ttctgatcaggagcccaatctgtgacaaaactcacactctcaccgtgctcagcagcctgaactcctgggtgaccgtcagctctc
30 ctctcccccaaaacccaagcacacctctatgatctccggacccctgaggtcacatgctggtgggtgggtgagccacgaag
acctgaggtcaagttcaactggtacgtggcggcgtggaggtgcataatgccaaagcaaaagccgcgggagggagcagtaaac
agcagctaccgtgtgctcagcgtctcaccgtctgcaccaggactggtgaaatggcaaggagtacaagtgcaaggtctccaaca
aagccctccagcccccattcgagaaaacattctcgaagccaaaggcagccccgagaaaccacaggtgtacacacctgccccca
tccgggatgagctgaccagaacacaggtcagcgtacctgctgctcgaaggtcttctcacaagcgacatcgccgtggagtg
35 gagagcaatggcgagcgggagacaactacaagaccagcctccgtgctggactccgagcgtctcttctctctcactacaag
ctcaccgtggaacagagcaggtggcagcaggggaacgtctctctatgctcctgctgatgctgaggtcctgcacaaccactacacg
agaagagcctctcctgtctcgggtaaatgatctaga

30

Amino acid sequence:

MVSTAQFLGLLLWLTGGRCDIQMTQSPASLSASVGETVTITCRTSENVVSYLAW
40 YQQKQKGSPQLLVSAFAKTLAEGVPSRFSGSGGTQFSLKISSLPEDSGSYFCQHHS
DNPWTFGGGTELEIKGGGSGGGGSGGGSSAVQLQSGPSEKPGASVKISCKA
SGYSFTGYNNMNWVKQNNGKSLIEWIGNIDPHYGGTTYNRKFKGKATLTVDKSSST
AYMLKSLTSEDSAVYYCARSVGPMIDYWGQGTSTVTVSSDQEPKSCDKTHTSPPC
SAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVH
45 HNAKTKPREBQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIETISKAK
KGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPP
PVLDSGSGFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKLSLSLSPGK

50

54. G28-1 seFv VH L11S (SSC-P)H WCH2 WCH3

Nucleotide sequence:

WO 2005/017148

PCT/US2003/041600

aagcttgcgcccatggatccacagctcagttccttgggtgctgctgctggtgttacaggtggcagatgfgatcatccagatgact
atgtccagcctccatctgcatctgtgggagagactgtccatccatgtcgaacaagtgaatgtttacgtattttgcttgggt
atgcacagaaacaggaaatctctcagctcctgtctctttggcaaaaacctgacgaagggtgtgctacaggttcagttggca
gtgcatgagcgcacaggttttcttctgaagatcagcagcctcgagcctgaagatctggaaagtatttctgtcaacatcatccgataat
5 cctgtgacgttgcgtggagggaccggaactggagatcaaaaggtggcgggtgctcggcggtgggtgggtgggtggcggtgacg
cgtcagcgttccagctcagcagcttggacgtgagtcggaaaagcctggcgctcagtgaaagtattcgaagcttctgtgtact
catctactggctacaatatgtaactgggtgagcagaataatggaaagagccttgatgggtgaaatattgatccttattatgtgtgt
actacctacaaccggaaagtccaaggccaagggccacattgactgtgagacaatcctccaagcagcctatgctcagctcaagagct
gacatctgaggactctcagctctattactgtgcaagatggctggccctatggactactgggtcgaaggaaocctcagtcaccgtctc
10 tctgtatcaggagcccaatctctgacaaaactcacatccaccgtgcccagcactgaactcctggggggaccgtcagctct
cctctccccccaaaaccgaagcaccctcatgatctcccgaccctgaggtcacaatgcgtgggtgggtggacgtgagccacgaa
gacctgaggtcgaagtcaactgtgacgtggagggcgtggaggtgcataatgccaaagcaaaagcggcggtggagcagctacaa
cagcagctlacgtgtgtgacgtcctcaccgtcctgaccagagctggtgctgaatggcgaaggagctacaagtgaagctgtctcaac
aaagccctccagcccccactcagaaaacaaatctccaagccaagggcgagcccccagaaaccacaggtgtgacacacctgccccc
15 atccgggatgagctgaccaagaacaggtcagcctgaactgacctgctcgaagccttctatccagcgcacatgccgtggaggtgg
gagagcaatggggcagccgggaacaactacaagaccagccctccgtgctggactccgagcgctccttctctctacagaag
ctcaccgtggacaagagcagctggcagcgggaacgtctctctatgctcctgtagatgaggtcctgtcacaaccactacacgc
agaagagcctcctctctcgggtaaatgatctaga

20 Amino acid sequence:
MVSTAQFLGLLLWLTTGGRCDIQMTQSPASLSASVGETVTITCRTSENVYSYLAW
YQKQKGSQQLLVSFAKTLAEGVPSRFSGSGGTQFSLKISSLPQEDSGSYFQOHSS
DNFWTFGGGTELEIKGGGGSGGGSGGGSSAVQLQSQSGPESEKPGASVKISCKA
SGYSFTGYNNMNVVKQNNGKSLIEWIGNIDPYVGGTYYNKKFKGKATLTVDKSSST
25 AYMQLKSLTSEDSAVYYCARVGPMDYWGQGTSTVTVSSDQEPKSSDKTHTSPPCP
APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVH
NAKTKPREQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAK
QKPREPQVYVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPP
VLDSDGSFFLYSKLTVDKSRWQQGNVFSQSCVMHEALHNHYTQKSLSLSPGK

30 II. 54. ICTLA4 IIIG1 (SSS-S)II P238SII2 WCH3

Nucleotide sequence:

atgcttgccttggatttcagcggcacaaggctcagctgaacctggctgccaggacctggccctgcacttctgtttttctctcttc
atccctgtcttctgcaaaagcaatgcacgtggccagcctgctgtgtactgccagcagcgaggcagcgccagcttgtgtgtga
35 gtatgcatctccagcgaagccactgaggtccgggtgacagctgttcggcaggtgacagccaggtgactgaagtctgtgcgcg
aacctacatgacggggaatgagttgaccttctagatgattcatctgcagcggcactccagtggaatcaagtgaaactacat
ccaaggactgagggccatggcagcgggaactctacatctgcaaggtggagctcatgaccaccgccatactactcgggcatagc
caacggcaaccagatttgaattgatccagaaccgtgccagattctgatcaaccaaatctctgacaaaactcacacatcccca
ccgtctcagcagctgaactcctgggggagctgacgttctctctctcccccaaaaaccgaagcaccctatgactccggac
40 cctcaggtgcacatgcgtgtgtgtggacgtgagccacgaagaccctgaggtcaagttcaactgtgacggcggtgtggaggt
cgtatgaatggcaagcagcggcgaggagcagctacacagcagcagctgtgtgtgacgtgtcctacctgtcggcagcag
actggctgaatggcaagaggtacaaagtgcgaaggtctccaacaaagccctccagcccccacgagaaacaatctccaagcca
aaggcgagcccccagacaacaggtgtacacccctcccccatccgggatgagctgaccaagaagcaggtcagcctgactcgc
ctgtgcaaggcttctatcccccagcgcacatcgccgtgtgaggtggagagcgaagggcagccgggaacacaactacaagacacg
45 tcccgtgctgactcgcagcgtcctctctctctacagcgtcaccgtggacaagagcaggtggcagcaggggaacgtcttct
catgctcctgtagatgaggtcgtcacaaccactacacgcagaagagcctcctctgtctccgggtaaatga

Amino acid sequence:

MACLGFRHQHKQALNLAARTWPCTLLFFLLFIPVFCAMHVAQPAVVLASSRGIAS
50 FVCEYASPGKATFEVRVTVLRQADSQVTEVCAATYMTGNELTFLLDSDICTGTSSGN

WO 2005/017148

ECT/US2003/041600

QVNLTIQGLRAMELDTGLYICKVELMYPPPYLGLIGNGTQIYVIDPEPCPDSDQPKSSD
KTHTSPPSSAPELDDGSSSVFLFPKPKDLMISRTPEVTCVVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
5 NNYKTTTPPVLDSDGSFPLYSKLTVDKSRWQQGNVFCSCVMHEALHNNHYTQKLSLS
SPGK

55. Fe2-2 VL

Nucleotide sequence:

10 gttgtaagcttgccgccatggattcacagccccagggttcttatgttactgctgctatgggtatctggtacctgtggggacattgtgatg
tcacagcttcacatccctccctagctgtgctcagttggagagaagggttctatgagctgcaagtcacagtcagagccctttatataatcacaaat
caaaagaactacttgccctgtgaccacagatataccaggcgagctctcctaactgctgatttactgggcacctacagggaatctgg
gtccctgafcgcttcacagcagcagtgatctgggacagatttacctctaccatcagcagagtgtaagctggaagacctggcagttta
15 ttactgtcagcaatattatacctatctcccccaggttcggaggtggcaccaggctggaataaagggtggcggtgctcggcggtg
gtgggtcgggtggcgggcgggagctcg

Amino acid sequence:

MDSQAQVLMLLLLVWSGTCGDIVMSQSPSSLA VSVGEKVSMSCKSSQSLLYNHN
QKNYLA WYQIQPGSPKLLIYWASTRESGVDPDRFTGSGSGDTFTLTISR VKAEDLA
20 VYYCQQY YTYPTFGGGTKLEIKGGGGSGGGGGSGGGSS

56. FC2-2VH

Nucleotide sequence:

25 Gggagctcgcagctgctcagttgaaggagtcaggacctggcctggctggcgccctcacagagcctgtccatcacatgcacccgtctca
gggttctcatfaaccgtctatgggttaactgggtgccagcctccaggaaaggctggactggctgggaatgatalggggtgat
ggagcagcagactataatcagctctcaaatccagactgagcatcagtaaggacaactccaggagccaagtttcttaaaaaaggac
agtctacaaactgatgacacagccaggtactactgtgccagagatcactatgttaccacatgtatgactgactggggtcaaggaa
acctcagtcaccgtctcctctgatcag

30 Amino acid sequence:
GSSQVQLKESGCPGLVAPSQSLSTCTVSGFSLTVYGVNVWRQPPGKGLDWLGMIV
GDGSTDYNSALKSRLSISKDNSQVFLKMDSLQTDTRYVCARDHYGTHYAM
DYWGQGTSTVTVSSDQ

57. FC2-2scFv

Nucleotide sequence:

35 gttgtaagcttgccgccatggattcacagccccagggttcttatgttactgctgctatgggtatctggtacctgtggggacattgtgatg
tcacagcttcacatccctccctagctgtgctcagttggagagaagggttctatgagctgcaagtcacagtcagagccctttatataatcacaaat
caaaagaactacttgccctgtgaccacagatataccaggcgagctctcctaactgctgatttactgggcacctacagggaatctgg
40 ggtccctgactgcttcacagcggagtgatctgggacagatttacctctaccatcagcagagtgtaaggctgaagacctggcagttta
ttactgtcagcaatattatacctatctcccccaggttcggaggtggcaccaggctggaataaagggtggcggtggctcggcggtg
gtgggtcgggtggcgggcgggagctctcagggtgcagttgaaggagtcaggacctggcctggctggcgccctcacagagcctgtcc
atcacatgaccctgtcaggggtctcattaaacctgtatggtttaactgggtgcagagcctccaggaagggtctggactggttgg
gaattgatattgggtgatgggaagcacagactataatcagctctcaaatccagactgagcatcagtaaggacaactccagagccaa
45 gtttcttaaaaatggacagctcacaactgatgacacagcaggtactactgtgccagagatcactatgttaccacatgtatgag
actactggggtcaaggacaactcagtcaccgtctcctctgatcag

Amino acid sequence:

50 MDSQAQVLMLLLLVWSGTCGDIVMSQSPSSLA VSVGEKVSMSCKSSQSLLYNHN
QKNYLA WYQIQPGSPKLLIYWASTRESGVDPDRFTGSGSGDTFTLTISR VKAEDLA
VYYCQQY YTYPTFGGGTKLEIKGGGGSGGGGGSSQVQLKESGCPGLVAPSQ

WO 2005/017148

UCT/US2003/041600

SLSTITCTVSGFSLTVYGVNVWRQPPGKGLDWLGMWGDGSTDYNSALKSRLSISK
DNSKSQVFLKMDSLQTDĐTARYYCARDHYGTHYAMDYWGQGTSTVTSSDQ

58. FC2-2 VHL11S

5 Nucleotide sequence:

gggagctctcagctgacgttgaaggagtcagaccctggctcggcgccctcacagagcctgtccatcacatgcaccgtctcag
ggcttcattaacctctatggtgttaactgggttcgccagcctccaggaaaaggctggagctggcggatgataggggtgatg
gaagcacagactataatctcgtctcaaatccagactgagcatcagtaaggacaaactccaaggacgaagtgtttcttaanaatggaca
gtctacaactgatgacacagccaggtactactgtgccagatgactactggtaaccactatgctatgactactggggccaaggaa
10 cctcagtcaccgtctctctgatcag

Amino acid sequence:

(GSS)QVQLKESGPGSVAPSQSLSTITCTVSGFSLTVYGVNVWRQPPGKGLDWLGM
WGDGSTDYNSALKSRLSISKDNSKSQVFLKMDSLQTDĐTARYYCARDHYGTHY
15 MDYWGQGTSTVTSSDQ

59. FC2-2 VH L11S scFv

Nucleotide sequence:

gttgtaaagcttgcgccatgattcacaggccaggttcttatgttactgctgctatgggtatctggtacctgtggggacattgtgatg
20 tcacagcttccatctcctccctagctgtgctagttggagagaaggtttctatgagctgcaagtcacagtcagacctttataatcacaaat
caaaaagaactacttggcctggtaaccagcagataccaggcagctctcctaaactgctgatttactgggcatccactagggaaatctgg
gttccctgatctgcttcacaggcagtgatctgggacagattcacctcaccatcagcagagtgaaggctgaagacctggcagttta
ttactgtcagcaatattatacctatcctccacgttcggagggtggcaccaggctggaaataaaagggtggcggtgctcggcggtg
25 gtgggtcgggtggcgggcgaggagctctcaggtgaggtgaaggaagtcaggacctggctcgggtggccctcacagagcgtctcc
ateacatgcaccgtctcagggtctcattaaacctctatggtgtaactgggttcgccagcctccaggaaagggtggctggactggctg
gaatgatagtggtggtgatggaagcacagactataatcagctctcaaatccagactgagcatcagtaaggacaactcaagagccaa
gttttcttaaaaatggacagctcacaactgatgacacagcaggtaactatggtccagagatgactactggtaaccactatgctatgg
actactggggtcaaggaaacctcagtcacccgtctctctgatcag

30 Amino acid sequence:

MDSQAQVLMILLLLVWSGTCGDIVMSQSPSSLA VSVGEKVSMSCKSSQSLYNIN
QKNYLAWYQQIPGQSPKLLIYWASTRESGVDPDRFTSGSGSDTFTLTISR VKAEDLA
VYYCQQYYTTPPTFGGGTKLEIKGGGGSGGGSGGGSSQVQLKESGPGSVAPSQ
SLSTITCTVSGFSLTVYGVNVWRQPPGKGLDWLGMWGDGSTDYNSALKSRLSISK
35 DNSKSQVFLKMDSLQTDĐTARYYCARDHYGTHYAMDYWGQGTSTVTSSDQ

60. FC2-2 (SSS-S)H WCH2 WCH3

Nucleotide sequence:

gttgtaaagcttgcgccatgattcacaggccaggttcttatgttactgctgctatgggtatctggtacctgtggggacattgtgatg
40 tcacagcttccatctcctccctagctgtgctagttggagagaaggtttctatgagctgcaagtcacagtcagacctttataatcacaaat
caaaaagaactacttggcctggtaaccagcagataccaggcagctctcctaaactgctgatttactgggcatccactagggaaatctgg
gttccctgatctgcttcacaggcagtgatctgggacagattcacctcaccatcagcagagtgaaggctgaagacctggcagttta
ttactgtcagcaatattatacctatcctccacgttcggagggtggcaccaggctggaaataaaagggtggcggtgctcggcggtg
45 gtgggtcgggtggcgggcgaggagctctcaggtgaggtgaaggaagtcaggacctggcctgggtggccctcacagagcgtctcc
atcacatgcaccgtctcagggttctcattaaacctctatggtgtaactgggttcgccagcctccaggaaagggtctggactggctg
gaatgatagtggtggtgatggaagcacagactataatcagctctcaaaatccagactgagcatcagtaaggacaactccagagccaa
gttttcttaaaaatggacagctcacaactgatgacacagcaggtaactatggtccagagatgactactggtaaccactatgctatgg
actactgggtcaaggaaacctcagtcacccgtctctctgatcaggagagcccaaatctctgcagcaaaactcacacatctccaccgtct
cagcaccctgaactctctgggtgacccgtcagcttctctctcccccnaaaccagaaggacaacctatgatctcccggaccctgag
50 gtacatgctgtgggtgtgacctggaaccacgaagaccctgaggtcaagttcaactgtgacgtggagacggcggtggaggtgataat
gccaaacaaaagccggcggaaggacngtacaacagcagctaccgtgtgtcagcgctctcaccgtctctgcacaggagactggt

WO 2005/017148

PC/T/US2003/041600

gaatgcaaggagtagtaagctgcaagggtctccaaacagccctccagcccccatcgagaaacacatctccaaagccaaaggc
agccccgaagaccacaggggtgacacctgccccatccgggatgagctgaccaagaacaggtcagcctgacctgctgtca
aaggctctatccaaagacatcgccgtggagtgaggagagagagggcagccggagaaactacaagaccagcctcccgtg
ctggactccgacggctctctctctctacagcaagctcaccgtgacaaagagcaggtggcagcaggggaagctctctcatgctc
5 cgtgatgatgaggtctgcacaaccactacacgcagaagagcctctcctgctcgggtaaatgatctaga

Amino acid sequence:

MDSQAQVLMLLLLVWSGTCGDIVMSQSPSSLA VSVGEKVSMSCKSSQSLLYNHN
QKNYLAWYQQIPGQSPKLLIYWASTRESGVPDRFTGSGSGTDFLTITSRVKAEDLA
10 VYYCQQYYTYPTFGGGTKLEIKGGGSGGGGSGGGSSQVQLKESGPGLVAPSQ
SLSIITCTVSGFSLTVYGVNWVRQPPGKGLDWLGMWGDGSTDYNALKSRLSISK
DNSKSQVFLKMDSLQITDDTARYYCARDHYGTHYAMDYWGQGSTVTVSSDQEPK
SSDKTHTSPSSAPELLGGPSVFLFPPKPKDITLMISRTPEVTCVVDVSHEDPEVKF
NWWYDGVVEVHNATKPREEQYNSTYRVSVLTVLHQDWLNGKEYKCKVSNKA
15 LPAPIEKTISKAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESN
GQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQ
KSLSLSPGK

61. FC2-2 VHL11S (SSS-S)H WCH2 WCH3

20 Nucleotide sequence:

gttgtaagcttgccgcacatgattcacagcccaggttcttatgtactgctgctatgggtatctggtaacctgtggggacatgtgatg
tcacagcttcacatccctcctagctgtgtcagttggagagaaggttctatgagctgcaagctccagtcagagccctttatataacacaa
caaaaagactactctggcctggtaccagcagataccagggcagcttctaaactgctgatttactgggcatccactaggggaatctgg
gtgtccctgaltcgtctacagcagcgtggtgatctggagcagatttactctcaccatcagcagagtgaaaggctgaagactgtgcagttta
25 ttactgtcagcaatattatactatctccacgttcgaggtggcaccagctggaataaaagggtgcccgtgtgctcggcggtgtg
gtgggtcgggtggcgccgggagctctcaggtgcagttgaaggagtcagacactggtcgtggtggccctcacagagcctgtcc
atcacatgacacgtctcaggggttctcattaacctgtatgtgttaactgggttcgccagcctccaggaaagggtgtgacgtgctg
gaatgatatgggtgatggaagcacagactataaactcagctctcaaatccagactgacatcagtaaggacaaactcaagagccaa
gttttcttaaaaatggagactctcaaaactgatgacacagccagggtactactgtgccagatcactatgtaaccaactatgctatgg
30 actactggggtcaaggaaacctcagtcacccgtctctctgaltcaggcccaaatcttctgacaaaactcacatccccaccgtctc
cagcacctgaaactcctgggtggacgtcagcttctctcttcccccaaaacccaaaggacacccctcatgctctccggaccctgag
gtcacatcggtgtggtggcagctgagccacgaagacctcagggtcaaggttcaactgtgacgtggtgacggcggtgaggtgcataat
gccaaagacaagccggcggaaggagcagtacaacagcacgtaccgtgtggtcagcgtctcaccgtctgcaccaggactggtgct
gaatggcaaggagtagcaaggtgcaagggtctccaaacaaagccctccagcccccacgcagaaaacactctcacaagccaaaggcg
35 agccccgagaacacaggggtacacacctgcccccacccgggaatgagctgaccaagaacacaggtcagcctgacctgctgctga
aaggctcttatccaaagacatcggcgtgagtgaggagacaaaggcagccggagaaactacaaagaccagcgtccctggtg
ctgacatccagagcgtctctctctctctacagcaagctcaccgtgagacaaagacagcaggtggcaggggaacgtctctcatgctc
cgtgatgatgaggtctgcacaaccactacacgcagaagagcctctcctctgctcgggtaaatgatctaga

40 Amino acid sequence:

MDSQAQVLMLLLLVWSGTCGDIVMSQSPSSLA VSVGEKVSMSCKSSQSLLYNHN
QKNYLAWYQQIPGQSPKLLIYWASTRESGVPDRFTGSGSGTDFLTITSRVKAEDLA
VYYCQQYYTYPTFGGGTKLEIKGGGSGGGGSGGGSSQVQLKESGPGSVAPSQ
45 SLSIITCTVSGFSLTVYGVNWVRQPPGKGLDWLGMWGDGSTDYNALKSRLSISK
DNSKSQVFLKMDSLQITDDTARYYCARDHYGTHYAMDYWGQGSTVTVSSDQEPK
SSDKTHTSPSSAPELLGGPSVFLFPPKPKDITLMISRTPEVTCVVDVSHEDPEVKF
NWWYDGVVEVHNATKPREEQYNSTYRVSVLTVLHQDWLNGKEYKCKVSNKA
LPAPIEKTISKAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESN
GQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQ
50 KSLSLSPGK

WO 2005/017148

PCT/US2003/041600

62. UCHL-1 VH

Nucleotide sequence:

atggcgacggttactctcttactctgctactgattgttctgcatatgtctctccagattactctgaaagagcttgccctgggacttt
gcagccctccagaccctcagctgactgtgtcttctctgggtttcactgaccactatggtataggagtaggttggttcctcagcct
ccaagggaagggtctggagtgctgacacacatttggggaaatgataataagfactataacacagccctcaggagccgggtcacaac
tctccaaaggattctcccaacaaccaagfactctcctaagatgccaatgtggacactgcagataccgccacatactactgtctctacg
gtcactacttactggggccaaggactctggtcactgtctctgca

Amino acid sequence:

MGRLTSSFLLLVPAAYVLSQITLKESGPGILQPSQTLSTLCSFSGFSLTITYGIGVGWIR
QPPGKLEWLTHIWVNDNKYYNTALRSRLTISKSSNNQVLLKIANVDTADTAT
YYCLYGYTYWGQGLTVLSA

63. UCHL-1 VL

Nucleotide sequence:

atgaagtgcctgttaggctgttggtgctgatgttctggattctgcttccatcagtgatgttgatgacccaaactccactctccctgc
cttcaagctcttgagagacagccctcactctcttgcagatctagtcagagcccttcttatacgtaatggaaacacctatttaccattggtaact
gcagaagccagcgccagctctcctcaaaactctgatctacaaactttccaaaccgattttctggggctccagacaggttcagtgccagtgagg
atcaggagacagatttcacactcaagatcagcagagtgaggctcagggatctggaggtttattctctctcctaagtacacatgttccg
tggacgttctgggtggagcacaagctggaaatcaaa

Amino acid sequence:

MKLPVRLLVLMFWIPASISDVVMTQTPLSLPVSLGDAQSISCRSSQSLLYSNGNTYL
HWYLYQKPGQSPKLLIYKLSNRFSGVPDRFSGSGSDFTLKISRVEAEDLGVYFCS
QSTHVPWTFGGGKLEIK

64. UCHL-1 scFv

Nucleotide sequence:

gtgttaaagcttccgccatgaagttgcctgttaggctgttggtgctgatgttctggattctgcttccatcagtgatgttgatgaccc
aaactccactctccctgctgtcagcttggagatcagccctccactcttgcagatctagtcagagcccttttaccagtaaatggaaac
ctctatttaccattggtaacctgcagaagccagccagctctcacaactctgatacacaactttccaaaccgattttctgggtcccca
caggttcagtgccagtgatgcagggacagatttcacactcaagatcagcagagtgaggctcaggatctggaggtttattctctgctc
tcaangtacacatgttccgtggagcttccgggtggagccaccaagctggaaatcaagatggcgtggctcggcggtggtgatct
ggaggagtggtggagctctcagattactctgaaagaatctggccctgggatctgcagccctccagaccctcagctcgaattgttctt
tctctgggttttctcagaccactatggtataggagtaggttggttcagctcagccctcagggaagggtctgagtggtgcacacat
ttggtggatgataataatgactactataacacagccctgaggagccggctcacaactccaaaggattctctcacaaccaaagtaactct
caagatcgcaatgtggacactgcagataccgccacatactactgtctctacggctacacttacttgggcccaagggaactctgggtca
ctgtctctctgctgata

Amino acid sequence:

MKLPVRLLVLMFWIPASISDVVMTQTPLSLPVSLGDAQSISCRSSQSLLYSNGNTYL
HWYLYQKPGQSPKLLIYKLSNRFSGVPDRFSGSGSDFTLKISRVEAEDLGVYFCS
QSTHVPWTFGGGKLEIKDGGSGGGGSGGGSSQITLKESGPGILQPSQTLSTLCS
FSGFSLTITYGIGVGWIRQPPGKLEWLTHIWVNDNKYYNTALRSRLTISKSSNN
QVLLKIANVDTADTATYYCLYGYTYWGQGLTVTSAD

65. UCHL-1 VH H1SL12S

Nucleotide sequence:

gggagctctcagattactctgnaagagctctgcccctgggactctgcagccctccagaccctcagctcgaactgttcttctctctgggtt
tcaactgaccactatggtataggagtaggttggttcagccctccagggaagggtctggagtggctgcacacatttgggtggaat

WO 2005/017148

PT/US2003/041600

gataataagtactataacacagccctgaggagccggctcacaatctccaaagattcctccaaacaaagattcctcgaagtcgc
caatgtggacactgcagataccgccacatactactgtctctacggctacacttactggggccaaaggagactctggtcactgtctctgct
gataca

- 5 Amino acid sequence:
(GSS)QITLKESGPGSSQPSQTLSTLCSFSGFSLLTTYGIGVGWIRQPPGKGLEWLTHIW
WNDNKYNTALRSRLTISKDSSNNQVLLKIANVDTADTATYYCLYGYTYWGQGT
LVTVSAD

10 **66. UCHL-1 scFv VH L11S**
Nucleotide sequence:

gtgtttaagctgccgccatgaagttgctgttaggctgttgctgctgatgttcggattcctgctccatcagtgatgttgatgacc
aaactccactctccctgctgtcagcttggagatcaggccctcactctctgagatctagtcagagccctttacagtaatggaac
15 acctatttaccattggtacctgcagaagccaggccagctctccaaactcctgacttacaactttccaacgattttctgggtcccaaga
cagggttcagtgccagtggatcaggagcagattcactcaaatcagcagagtgaggagctgaggatctggagattttctgctc
tcaaatgtacacatgttccgtggacgttcgtggagggcaccagctggaaatcaaatggcgggtgctcggcggtgggtgact
ggagagagtgaggagctcctcagattactctgaagagctgtgcccctggagagctccagccctccagacccctcagctgtgactgttc
ttctctgggttttactgaccattatggtataggagtaggtggattcgtcagccctccagggaaggctggagtggtgcgacacac
20 atttgggtgaatgataataagactataacacagccctgaggagccgctcacaatctccaaggattcctccaaacaaacagactc
ctcagatcggcaatgtggagactgcagataccgccacatactactgtctctacggctacacttactggggccaaaggactctggtc
actgtctctgctgataca

- Amino acid sequence:
25 MKLPVRLVLMFWAPISISDVVMTQTPLSLPVSLGDQASISCRSSQSLLYSNGNTYL
HWYLLQKPGQSPKLLIYKLSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDLGVYFCS
QSTHVPWFEGGGTKLEIKDGGGSGGGSGGGSSQITLKESGPGSSQPSQTLSTLTC
SFGSFLTTYGIGVGWIRQPPGKGLEWLTHIWWNDNKYNTALRSRLTISKDSSNN
QVLLKIANVDTADTATYYCLYGYTYWGQGT LVTVSAD

30 **67. UCHL-1 scFv (SSS-S)H WCH2 WCH3**
Nucleotide sequence:

gtgtttaagctgccgccatgaagttgctgttaggctgttgctgctgatgttctggattcctgctccatcagtgatgttgatgacc
aaactccactctccctgctgtcagcttggagatcaggccctcactctctgagatctagtcagagcccttttaccagtaatggaac
35 acctatttaccattggtacctgcagagccaggccagctctccaaactcctgacttacaactttccaacgattttctgggtcccaaga
cagggttcagtgccagtggatcaggagcagatttcaactcaaatcagcagagtgaggagctgaggatctggagattttctgctc
tcaaatgtacacatgttccgtggacgttcgtggagggcaccagctggaaatcaaatgagtggtgctcggcggtggtgact
ggagagagtgaggagctcctcagattactctgaagagctgtgcccctggagattcagccctccagagccctcagctgtgactgttct
40 tctctgggtttcaactgaccattatgggtataggagtggtggattcagccctccagggaaggctcggagtggtgctgacacacat
ttgtggaaatgataataagactataacacagccctgaggagccgctcacaatctccaaggattcctccaaacaaacagactcct
caaagtcgcgaatgtggagactgcagataccgccacatactactgtctctacggctacacttactggggccaaaggagactctgtca
ctgtctctcgtgatcaggagcccaaatcttctgacaaaactcacacatcccaccgtctcagaccctgaaactcctgggtggaccgt
cagctctctctctcccccaaaaacccaggacaccctcatgatctccggacccttgaggctacatgctgggtgggagctgagc
45 caccgaagaccctgaggctcaagttcaactgtgactgtggacggcgtggagtgatgataatgccaaagacaaaggccggaggagca
gtacaacagcagctaccgtgtgtgtcagcgtcctaccgtcctgaccaggagctggctgaatggcaggaagtacaagtgcaaggtc
tccaaacaaagccctccagcccccacatcgagaaaacatctccaaagccaaaggcagcccgagacacacagggtgtacacact
ggccccctccgggatgagctgaccacaagaaaccaggtcagcctgactgctgtgtcaaaaggctctatcacaaggcagacatcgccgtg
50 gagtggagagcgaatggcgagccggagaaacactacaagaccacgcctcccggtgctgagctcagcgtgagggctcctctctctac
agcaagctcaccgtggagacaagcaggtggcagcaggggaagcgtcttctatgctccgtgatgcatgaggtctgcacacaccat
acacgcagagagagcctctccctgtctccgggttaaatgactaga

PCT/US2003/041600

MKLPVQLPLVLMFWIPASISDVVMTQTPLSLPVSIGDQASISCRSSQSLSLYSNGNTYL
 HWYLVKPGQSPGKLLIKLISNRPFSVDPDRFSGSGSQTDFTLKISRVEAILEDGVYFCS
 QSTHVPTWFGGKLLIKLDGGSGGGSGGGSSQTLIKESGPGIQLPSQTLISLCS
 FSGFSLTYIGIGVQRWIRPPGKGLEWLTHIWWNDNKYYNTALRSRLTISKDSSNN
 QVLKLIANVDTADTATYYCLGYTYWGQTLVTVSADQPEKSSDKYDGVVSSNA
 ELIGPSVFLPEPPKPDTLMSRTEPTVCVVDVSHDEPVEKFNWYVDGVESHVA
 KTKPREEQYNSTYRVVSVTLVLIHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQ
 PREPQVYLYTPSRDELTKNQVSLTCLQGFPYSFDIAVEWESNGQPENNYKTPPVLD
 SDSGFFLYSLKTVDSKRWQGNVFCSCVMHEALHNNYTKSISLSPGK

15 Nucleotide sequence:

gtgtttaactgtccgccagaagttgctgttagagctgtgtgtgtctgtatgttgcgtatcttcgttcacatcagttgagttgatgacc
aaactccactctctcgtcgtcagcttggagatcagggctccatctctctgcagatctatgcagagcccttttacaatgaatgggaac
acattttacatgtgttacctgcagagagctgtctcaaaactctatctacatacaaaatttccaaactgattttcgtgggtccgaca
caggttcagttggcagtggtatcaggcgacagattcaactcaagatcagcagagttggagcgtgagatctggagatcttattctgtc
20 tcaagatcacatgtctgcgttcagctgtgtgtggggcaccacagctgaactcaagaatggcgtgtcctggcggcgtgtgtgtgtgt
ggagaggtgtggagagctcagatcttactgcagaagctgtgctcgtggcgtgaactccagccctccagaccactagctgactgtct
tttctcgtgtttcactgaccacttatgtataggagtagtgttggaftcgtcagcctccagggagggcgtgtgagtggtgcacac
atttgggtggaatgataatagatctatacaacagcgcgtgagagcgcgtctcaactctcaagagtttctcacaacaaagatct
ctcaagatgccaaagtggacactgcagatacggcatcactgagctgtctctcgtctacacttactggggcagaggaactgtgct
25 actgtctctgtgatcaggagcccaattcttgacaaactcacatccacccgtctcagacatcgaaactcgtgtggagcc
tagtcttctctctccccaacaccaaagcaccctatgctctcggaccctcgtgtgtctacatgctgtgtgtgtgagctgag
ccaggaagcagctgagctgaacttcaactgtctacgtggagcgtgagatgctcagatactccagacaacaaagccgctggagagc
agtacaacagcagctaccgtgtgtgtcagcgtctcaccgtctcgcacacggactgctgtgaatggcaaggagtaacagtgcaaggt
ctccacaacagccctccagccccactgagaaacatctctcaaaagccaaagcgtcagcccgagacacacagagctgtacacgt
30 tggcccactccggatgagctacagcaagacagctagcgtactcctcgaagctgtgtctatccaaagcagatccagctgt
ggagttgggagagcaatggcagccggagaaacactacaagaccagcctccgtgtgtgactccgacggctcctttctctcta
cagaagctacacgttcagcaagacagcgtggcgacagctgtctctatgctcctgtgatcatgagggctctgcacaacca
ctacacgcagaagagcctctcctgtctcgtgaatattctataa

MKLPVRLLVLMFWIPASISDVVMTQTPLSLPVSLGDQASISCRSSQSLYSNGNTYL
 HWYTLKQPQSGPKLLIYKLNRFSGVPDRFSGSGSGDFTLTKSRIVEADLGVYFCS
 QSTHVPWTFGGGTGLKLIKDGSGGGSGGGSGGSDITLKESGPGSSQSTLSLTC
 SFGSGLTTYGIGVGWIRQPPKGKLEWLTHIWWNDNKYYNTALRSRLTISKDSSNN
 QVLLKIANVDADTATYCYLGYTYVCGVGLTVISADQEPKSSDKYTHITSPSSAP
 ELGLGSPVFLFPKPKDILMSRTEPVTCTVVDVSHDEPFVKFNVDVGEVHNH
 KTKPREQYQNSTYRVLVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIKAKGQ
 PREPQVYTLPPSRDELTKNQVSLTCLVGFYFSPDIAVEWESNGQPENNYTKTTPVL
 DSDGSFFLYSKLTVDKSRWOOGNVFNCSVMHEALHNHYTOKSI SLSPGK

Nucleotide sequence:

50 gggagctctcaggctcagctgaagcagtcaggacctggctcagtcagctctcacagagcctgtccatcacctgcacagctctctg
gtttctcataactacclagctgtacacgggttcgccagcttcacaggaaagggtctggagtggtctgggaagtgatatggagtggtgg
aatcacagactataatgcagctttcatalccagactgagcaltaccaaaggacgattccaagagccaagtgttcttaaaatgaacagtc

WO 2005/017148

PCT/US2003/041600

tgcaacctaatgacacgcccatttattactgtgccagaanaatgggggtgataactacccttattactatgctatggactactgggggtcaa
ggaaacctcagtcaccgtctctcag

Amino acid sequence:

(GSS)QVQLKQSGPVSQSSQSLSIITCTVSGFSLTTYAVHWVRQSPGKGLEWLGLVI
WSGGITDYNAAFISRLSITKDDSKSQVFFKMNSLQPNDAIYYCARNGGDNYPPYY
YAMDYWGQGSTVTVSS

73. 5B9 VH L11S scFv

Nucleotide sequence:

aagcttgccgccatgagggttctctgctcagcttctggggctgcttgtgctctggatccctggatccactgcagatattgtgatgacgca
ggctgcattctccaatccaagtcaccttggaaacatcagcttccatctctcaggtctgataagagcttccatagataatggcatca
cttaillgtatlggtatctgcagaagccaggccagctctcctcagctcctgattatcagatgtccaaaccttgcctcaggagtcaccagaca
15 cgtcagtagcagtggtggtcagggaactgatttcacactgagaatcagcagagtgaggagctgaggatgfggggtgittattactgtgctc
aaaattcagaacttcgcctcagcttctggtgctgggaccangctggagctgaaacgggggtggcggtgctcggcggtgggtgggt
cgggtggcgccgggagctcaggtgcagctgaagcagtcagacctggctcagtgctcagctcagacagagcctgtccatcacct
gcacagtctctgtttctcattaaactaactatgctgtacactgggttcgccagctcaccagaaagggtgctgagtggtcggagtgat
atggagtggtggaactcagactataatgcagctttcatalccagactgagcatcaccaggacgntccagagccaaagttttctt
20 aaaatgaacagctctgcaacctaatgacacgcccatttattactgtgccagaanaatgggggtgataactacccttattactatgctatgga
ctactgggggtcaaggaaacctcagtcaccgtctctcag

Amino acid sequence:

ASQAQLGLLVLPWGSTADIVMTQAAFSNPVTLGTSASISCRSSKSLLSHNGITY
15 LRWYLOKPGQSPQLLIYQMSNLASGVPDRFSSSGSGTDFTLIRSRVIEADVGVYYC
AQNLELPLTFGAGTKLELKRGGGSGGGGSGGGSSQVQLKQSGPVSQSSQSLSI
TCTVSGFSLTTYAVHWVRQSPGKGLEWLGIWWSGGITDYNAAFISRLSITKDDSKS
QVFFKMNSLQPNDAIYYCARNGGDNYPPYYAMDYWGQGSTVTVSS

70. 5B9 scFv VH L11S (SSS)-II WCH2 WCH3

Nucleotide sequence:

aagcttgcgccatgaggttctctgctcagcttctggggctgcttgtgctctggatccctggatccactgcagatattgtgatgacgca
ggctgcattctccaatcagtcaccttggaaacatcagcttccatctcctcaggtctgataagagcttccatagataatggcatca
25 cttaillgtatlggtatctgcagaagccaggccagcttctcctcagctcctgattatcagatgtccaaaccttgcctcaggagtcaccagaca
ggttcagtagcagtggtggtcagggaactgatttcacactgagaatcagcagagtgagggtgaggatgfggggtgittattactgtgctc
aaaatcagaacttcgcctcagcttctggtgctgggaccangctggagctgaaacgggggtggcggtgctcggcggtgggtgggt
cgggtggcgccgggagctcaggtgcagctgaagcagtcagacctgggtcagtgtagtctcagagcctgtccatcacct
gcacagtctctgtttctcattaaactaactatgctgtacactgggttcgcagctcaccagaaagggtctggagtggtcggngtgat
40 atggagtggtggnaacacagactaataatgcagctttcatalccagactgagcatcaccaaaggacgattccaaagccaaagttttctt
aaaatgaacagctctgcaacctaatgacacagcccatttattactgtgccagaanaatgggggtgataactaccccttattactatgctatgga
ctactgggggtcaaggaaacctcagtcaccgtctctcctgacaggaccacaacttcttcgacaaaactcacaacccaccgctcctc
agccactgactcctgggtggaccgtcagcttctctctcccccaaaaaccangacacctcatgatctccggaccctcagg
tcacatgcgtggtggtgacgtgagccacgaagacctgaggtcnaagttcaactgctacgtgagcggcggtggagtgataatgc
45 caagacaanaagccgcgggaggagcagttacaacagcagctaccgtgtgtgctcagcgtcctcaccgtctcgcaccagagctggtgga
atggcaaggaggtacaaagtccaaggtctccaaanaagccctccagcccccagagaaaacatctccaaaggcnaaggcag
ccccgagaaacacnagggttacacctgccccatccgggatgagctgacaaagacaaggctcagctgactgctgctcaga
agctcttcaacagcagactcgcctggagtggtggagagcaatggcgagccggagagaacaaactacaagaccacgctcccgctgct
ggactccgacggctcttctctcagacnaagctcaccgtggacaagagcagtggtgcagcaggggaacgtctctcatgctcc
50 gtgatgcatgaggtcgtcacaacacactacagcagaagagcctcctcctgtctccgggtataatgatcatgag

WO 2005/017148

PT/US2003/041600

Amino acid sequence:

MRFSAQQLGLLVLPWGSTADIVMTQAAFSNPVTLGTASISCRSSKSLLSHNGITY
LYWYLQKPGQSPQLLIYQMSNLASGVPDRFSSSGSGTDFTLRISRVEAEDVGVYYC
AQNLELPLTFGAGTKLELKRGGGSGGGGSGGGGSSQVLKQSGPGSVQSSQSLSI
5 TCITVSGFSLTTYAVHWVRVQSPGKLEWLVGIWSGGITDYNAAFISRLSITKDDSKS
QVFFKMNSLQPNDAIYYCARNGGDNYPPYYAMDYWGQGTSTVTVSSDQEPKSS
DKHTSPSSAPELLGSPSVFLFPKPKDITLMISRTPEVTCVVVDVSHEDPEVKFNW
YVDGVVHNAAKTPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAP
PIEKTISKAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQP
10 ENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLS
LSPGK

15 **76. 2H7 scFv VH L11S (SSS-S)H P238SCH2 WCH3**

Nucleotide sequence:

aagcttgccgccatggaatttcagtcagatttcagcttctgctaatacagtgcttcagcataattgccagaggacaaattgtctct
cccagctccagcaaatctgtctgcatctccaggggagagctcacaatgactgcaggccagctcaagtgtgaattacatgcact
ggataccagcagaagccagatctccccaaacctgatttgcctccacacctgcttcaggctccctgctcgtcgtcagtg
20 gcagtggtctgagaccttactctctcacaatcagcagagtgaggctgaagatgctgcacctatttactgccagcagtgaggtt
taaccaccacagcttcggtgctggaccagctggagctgaagatggcgggtgctcggcggtgtgtggtcgtggagagagtg
ggagctctcaggttatctacagcagctgggctgagctcgtgagcctggggcctcagtggaagtgtcctgcagggctctggc
tacacattaccagttacaatatgactgggtgaagcagacacagcagagggcctggaattggattgagctattatccaggaat
ggtgtatctctcacaatcagaagttcaaggcgaaggccacactgactgtgacaaatctccagcagacgctacatgcagctcag
25 cagcctgcacatctgaagactctgggtctatttctgtgcaagagtgtgtactatagtaactcttactgtacttcgaigtctgtggcac
aggagaccaggtcaccgtctctctctcagcagcccaaatctctgacaaaactcaacatccccaccgtctcagcacctgaact
ctctgggggagtcgtcagcttctcttcccccacaaagcagacacctcatgctctccggaccctgaggtcacatgggtgg
tggtggacgtgagccacgaagacctgaggtcaagttcaactgtgacgtgagcgtggaggtgcataatgccaaagacaagc
30 cggcggagagcagctacacagcagctaccgtgtgtcagcgtctcaccgtctgcaccagcagctggtgaatggcgaagag
tacaagtcgaagcttccacaagaacctccagcccccacgagaaacaatctccaaagcacaagggcagccccgagaacc
acaggtgtacacacctgcccccatcccggaatgagctgaccaagaaccaggctcagcctgacctgctgtcacaaggcttctatccc
agcgacatcgccgtgagtgaggagcaatgggagcagccggagaacaactacaagaccagcctcccgtgctggactcagcag
gctctcttctctacagcaagctcaccgtggacagagcaggtggcagcagggagacgtctctcatgctccgtgatgatgag
gctctgcacaaacctacacgacgaagagcctctctctgctccgggttaaatgatcagta

35 Amino acid sequence:

MDFQVQIFSFLLISASVILARGQIVLSQSPAILASPGKEKVTMTCRASSVSVMHWY
QQKPGSPKPIWYAPSNLASGVPARFSGSGGTSYSLTISRVEAEDAATYYCQQWS
FNPPTFGAGTKLELKDGGGSGGGGSGGGGSSQAYLQSGAESVRPGASVKMSCK
40 ASGYTFTSYNMHWVKQTPRQGLEWIGAIYPGNGDTSYNQKFKGKATLTVDKSSS
TAYMQLSSLTSEDSAVYFCARVYYSSNYWYFDVWGTGTVTVSSDQEPKSSDK
DHTSPSSAPELLGSSSVFLFPKPKDITLMISRTPEVTCVVVDVSHEDPEVKFNWVY
DGVVHNAAKTPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE
KTISKAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPN
45 NYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSCVMHEALHNHYTQKSLS
PGK

78. 2H7 scFv VH L11S (SSS-S)H WCH2 WCH3

Nucleotide sequence:

50 aagcttgccgccatggaatttcagtcagatttcagcttctgctaatacagtgcttcagcataattgccagagacaaattgtctct
cccagctccagcaaatctgtctgcatctccaggggagagctcacaatgactgcaggccagctcagtggaattacatgcact

PCT/US2003/041600

Amino acid sequence:

79. 2H7_{scFv} VH L11S (CSS-S)H WCH2 WCH3

Nucleotide sequence:

399